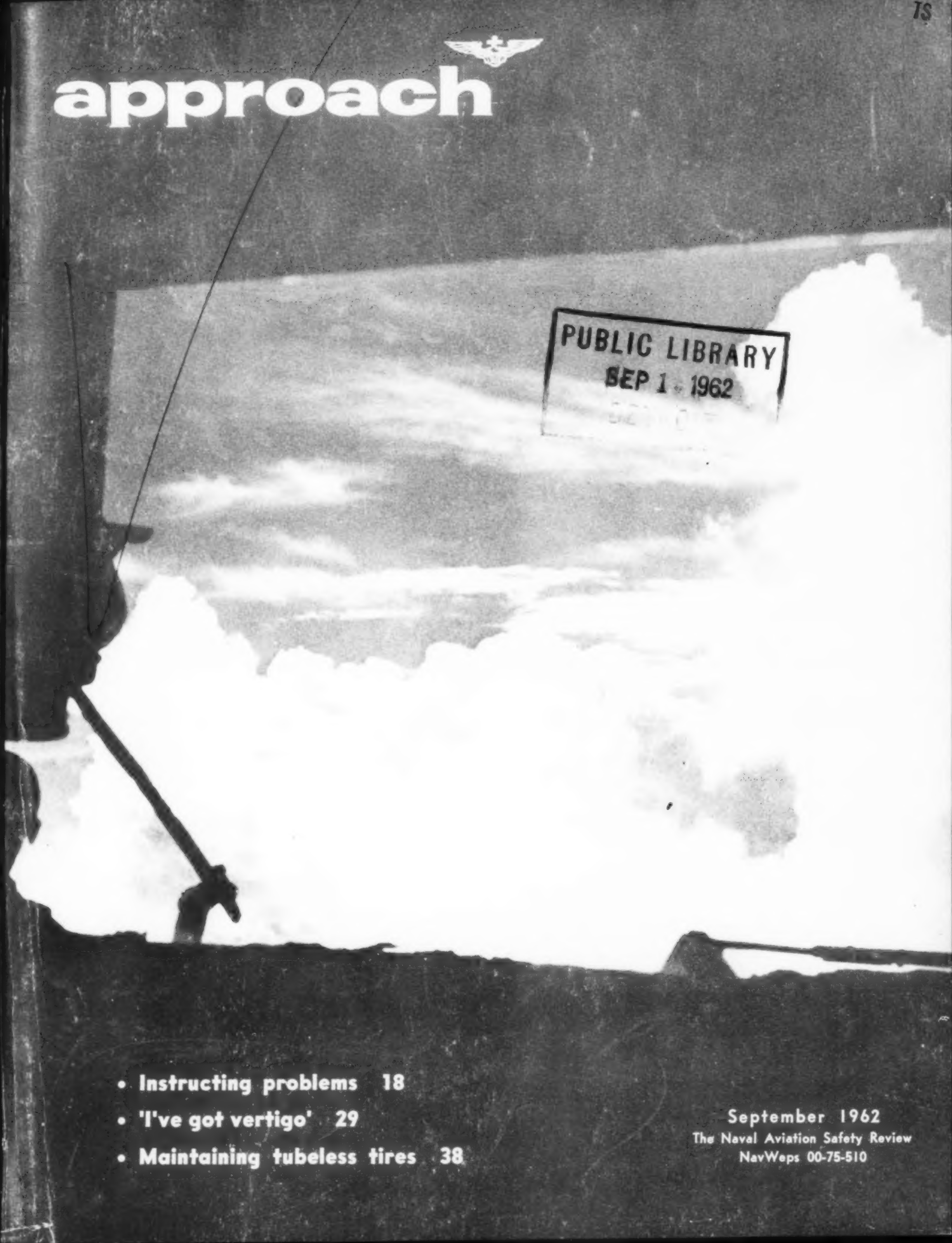
TS

approach



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NavWeps 00-75-510

While preflighting is shared by maintenance personnel and others, it is still the pilot's complete responsibility. The more complex the aircraft, the more complex the preflight. Many accidents and mishaps originate at this point—the caliber of preflight may well be the deciding factor in the success of a flight.

PREFLIGHT INSPECTION

by LCDR J. R. Foster

Walking is a healthy form of exercise, particularly when it's done around an aircraft on preflight—regardless of whether it's around a venerable SNB or a shiny new F4H.

It's very true that the shortest distance between the line shack and the cockpit is a straight line. However, it may also be the path to an avoidable accident that could spoil your whole day, let alone the skipper's. In addition, the exercise might just allow you to take a couple seconds off the 300-yard dash when you're up for your next physical fitness test. If this doesn't appeal to you, what about an extra push up?

A number of avoidable accidents and incidents are conceived on the flight line and born shortly thereafter because of haste or preoccupation on the part of the pilot, plane captain and/or other maintenance people. The granddaddy of them all was the gent who roared down the runway in his trusty bird with his wings folded. It flew but lift became very marginal and finally insufficient when the aircraft was banked in an attempt to get the beast back on deck so that the wings could be unfolded. It was hard to classify this one as poor aircraft design. In fact, it became obvious more gear could be hung on this particular type bird.

The Unlucky Ones

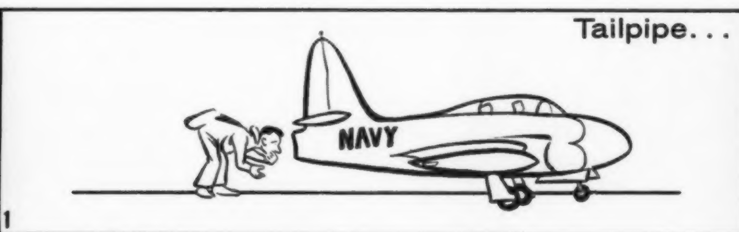
To illustrate the results of a poor preflight note the following selected *accident* briefs: 1

A4D

Pilot attempted takeoff knowing the fuselage fuel tank cap was missing. This fact was also known to the plane captain, tower operator and runway duty officer. Fuel siphoned out during the takeoff run and the aircraft caught fire and exploded resulting in substantial damage. Bernoulli's principle was vividly demonstrated once again.

TV-2

Pilot departed 1809R after a two-hour fueling delay on return cross-country trip. The last contact with the pilot was a VFR position report at 1971R (FL400). Seventeen minutes later aircraft crashed uncontrolled. Oxygen had been requested



verbally at transient air field but system was not filled. The suspected cause of this fatal accident was hypoxia due to oxygen depletion.

TF

The leading edge access panel opened on takeoff resulting in swerve on runway and violent buffeting when airborne. The pilot made a turn back to the field due to obstructions ahead and inability to increase airspeed. Pilot elected to land gear-up on first available runway. Panel was not secured by maintenance personnel or checked by plane captain or pilot prior to flight.

T2J

During takeoff engine rumbled. EGT went up rapidly and fire warning light came ON. Pilot landed aircraft with landing gear retracted. Cause of engine malfunction was duct cover jammed edgewise in inlet duct.

HOK1

Pilot attempted takeoff from ramp with port tiedown attached. Port main landing gear collapsed and aircraft rolled over on its side. Line man had never sent helicopter out before and pilot was in a hurry.

T-34B

Student pilot aborted takeoff when cowling blew off nose area. Aircraft ran off end of runway.

FJ-4

Plane captain determined external tank empty by use of sound method. He signed yellow sheet off to this effect. However, the tank was full. Pilot over-rotated on takeoff. The aircraft became airborne twice, each time the right wing dropped. Right wingtip dug into the plowed ground followed by an explosion and disintegration of the aircraft. The off-center weight of the external fuel tank aggravated the loss of directional control.

A4D-2

The pilot was in the landing pattern at an air station following a test flight. On the downwind leg he experienced severe engine vibration, and ejected. While the pilot survived the ejection he was fatally injured when he descended into the burning wreckage. The engine vibration was caused by the failure of the center main bearing due to oil starvation. Prior to flight the pre-oil cap for the center main bearing had been removed and not replaced. Neither the plane captain nor pilot noted the missing cap on the preflight inspection.

The Lucky Ones

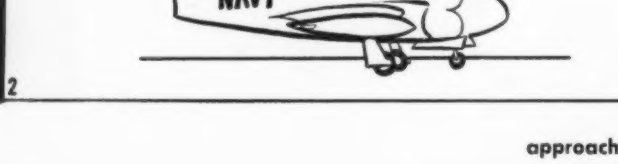
In addition to the spectacular accidents, there are great stacks of incidents and flight hazard reports that were conceived on the flight line. The most frequent category is the most easily avoidable. This involves the loss of access doors, covers and panels in flight. In almost every case the stage is set for loss because of someone's failure to properly secure the door or cover, coupled with a plane captain's and pilot's hastily-performed or inadequate pre-flight inspection.

Fortunately the majority of these losses are not serious or injurious to personnel, but are indicative of the frustratingly useless waste of time, money and manpower required to fix each one.

The Word

BuWeps Instruction 4370.2A establishes the policy and requirements of the Naval Aircraft Scheduled Inspection and Periodic Maintenance Program. Since World War II, Fleet and Fleet Marine Force squadrons have studied and evaluated various methods and systems for inspecting aircraft (including the Daily Inspection and Preflight Inspection). The basic objective of the Maintenance Program is improvement of policy direction, technical supervision, command and management or administrative control of all programs affecting aircraft maintenance activities in order to achieve maximum aircraft readiness and safety.

This discussion is limited to Daily Inspection and Preflight Inspection. The following definitions are set forth in BuWeps Instruction 7730.24:



Daily Inspection

A Daily Inspection will be accomplished between the last flight of the day and the next scheduled flight, providing no more than 72 hours accumulate between such inspection and the next scheduled flight. This inspection is basically a combination of requirements for checking equipment that requires daily verification of satisfactory functioning, plus requirements that prescribe searching for defects that become apparent after the aircraft is flown. It is intended that evidence of chafing, leaks and similar conditions be discovered and corrected during this inspection to preclude progression of such relatively minor problems to a state that would require major maintenance to remedy the deficiency. The Daily Inspection also includes those items which require inspection at intervals more frequent than prescribed for intermediate inspections. Items with frequencies such as "10 days," "15 hours," or "30 days," are inspected along with the daily items on the day on which they become due. The person authorizing the accomplishment of inspections such as 10 days, 15 hours, . . . , is governed by the accumulated calendar or operating time on the aircraft.

Note: Daily inspections are performed by VR squadrons upon termination of the last flight of a trip and before the next scheduled flight.

Preflight Inspection

A Preflight Inspection will be accomplished prior to each flight. This inspection consists of checking the aircraft for flight preparedness by performing visual examinations and operational tests to discover defects and maladjustments that, if not corrected, would cause accidents or aborted missions.

A few comments seem appropriate at this point.

It should be obvious that these inspections are of vital importance, just as intermediate and major inspections, and they should be performed with care, by designated, qualified personnel. The preflight inspection should be made by a qualified plane captain who shall sign the Naval Aircraft Flight Record (OpNav Form 3760 -2) upon completion of each inspection. The completed preflight inspection form is made available to the pilot prior to his signing and accepting the aircraft for flight.

The Handbooks of Inspection Requirements (HIR) issued by direction of the Chief of the Bureau of Naval Weapons, contain the mandatory minimum inspection requirements (Daily/Preflight Inspection Items). It should be realized that specific model aircraft inspection requirements as established and published by direction of the Chief of the Bureau of Naval Weapons are minimum requirements and, as such, are mandatory. Enclosure (5) of BuWeps Instruction 4730.2A explains revision provisions and generally describes HIR.

The Plane Captain

Safety is people and the plane captains of Navy aircraft should be well indoctrinated in their responsibilities in regard to preflight and daily inspections. This is a supervision job from the maintenance officer on down. Supervisors *must* stress the importance of the daily and preflight inspection form and insist upon its use at the actual scene of inspection.

In analyzing a recent accident it was found that two plane captains had conducted an entire 163-item daily preflight without the use of the check sheet. It was further determined that this had apparently been standard procedure as there was no compunction on the part of the plane captain to return to the line shack, fill out the check sheet and sign it.

At this point it is presumed a few people's blood pressures are up a little. A few basic leadership principles can eliminate a situation like the one described above. If plane captains are properly indoctrinated concerning the responsibility they have been entrusted with, it is very likely pencil checks in the line shack will rapidly disappear. After proper indoctrination, supervisors should readily be able to single out individuals whose sense of responsibility is lacking. Then the proper action is to get these people away from airplanes *now,* not after an incident occurs that might endanger an aircraft and personnel.

Supervision is not a mere inspection of the nature of the duties of men. Only when his men exhibit zeal in their work, take pride in the accomplishment of their work, evidence confidence in their leader, show a healthy mental and emotional state of mind and possess efficient work habits can the supervisor be certain that his leadership is effective. Good leadership and safety are inseparable.

Now is the time for any maintenance officer, maintenance chief or line chief worth his salt to ask himself the following questions:

Have all plane captains under my control been thoroughly and frequently briefed on the responsibilities they have been entrusted with?

Has each plane captain demonstrated complete knowledge of each and every item listed on the inspection forms he will use before he is allowed to sign off these forms?

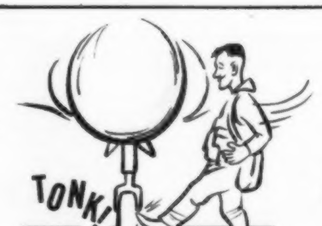
Are my line maintenance supervisors supervisors in the true sense? Do they exhibit true leadership characteristics? If not, why not?

The Pilot

With the advent of jet aircraft and the age of supersonic flight, a new supersonic pilot preflight inspection evolved. This new preflight plan consisted of two steps, namely: 1. Kick the tire (preferably the one closest to the cockpit access) and 2. light the fire.

Admittedly, this type preflight was simplicity itself. However, lighting the fire can best be placed in another area of the whole operation other than the preflight portion. This leaves kicking the tire the only item to remember when conducting a walk-around.


6



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Means PREflight

THAT'S preflight—our preflight inspections must be conducted prior to becoming airborne. (Otherwise this obviously makes the walk around portion rather difficult.) Yet—how many of us rush this vital part of flight? And why?

—The briefing took longer than planned.

—The pilot was late in arriving for the hop. (Particularly applies to proficiency pilots.)

—One last cup of coffee.

—The aircraft had been placed in an up status while final minor work was still going on.

—An interesting bull session in the line shack.

—The refuelers were late in arriving.

—Takeoff time moved up unexpectedly.

—One last required "head run."

—Last minute change in briefing due to weather or alteration of mission without change in takeoff time.

—Sudden or unexpected missions. You can't help in any emergency if you are spread all over the rice paddies.

Add them all together they spell poor planning and budgeting of time. Also, they spell accidents.

For the pilot with bad feet this poses an overwhelming problem.

The phrase "perform preflight check thoroughly" is drummed visually and orally into pilots from the day they walk toward their first airplane until they move into the right-hand seat as a venerable class 3 aviator. Flight planning, briefings and the mechanics of getting clearance are absorbing more and more of the pilot's time available for preflight. The trend is toward a quick walk-around with most of the time on the flight line or flight deck spent in the cockpit.

In the approach to a preflight the problem is to obtain the greatest benefit from a given amount of time. The pilot must do everything in his power to ensure he allows himself adequate time for a thorough, complete inspection. Certainly pilots have been involved in situations where they were rushed in order to meet priority operational commitments or combat necessity. The point is, when a pilot can control the situation, he is indeed selling himself short by not taking the time to conduct his preflight thoroughly.

The following are set forth to refresh all pilots on some of the items involved in a good preflight:

Check Part-2 Naval Aircraft Flight Record (OpNav form 3760-2). This allows the pilot to gain past maintenance history on the aircraft. If any maintenance work has been accomplished just prior to the anticipated flight the pilot may want to check certain areas more thoroughly in his walk-around.

Check the Daily and Preflight inspection forms to see if the plane you are about to strap on has been inspected properly. Note: A nice clean, neatly filled in form (greasy finger prints missing) should cause some doubt as to where the form was filled out.

As the assigned aircraft is approached, note position in relation to any obstruction which will possibly pose a problem during starting and taxiing. Take notice of the position and type of fire bottle.

Conduct cockpit and exterior preflight checks in accordance with NATOPS and Flight Manual. These checks consist of numerous items. This brings up an interesting point. How many aviators carry a printed preflight checklist? A checklist is certainly appropriate and necessary to cover the whole bird.

The proper preflight and postflight inspection is the direct responsibility of the pilot. The preflight may well be the deciding factor in the success of a flight. If discrepancies are discovered by the pilot, he should have them corrected prior to the flight or the aircraft should be "downed." Always inform the plane captain of the discrepancies and then record an intelligent writeup on the yellow sheet.

One final point. With some, while on cross-country

flights, the preflight inspection becomes increasingly less thorough with each additional leg of the trip and hour of the night. Then, too, for each day out the seriousness of any given mechanical deficiency decreases in importance. A good item to keep in mind is that a transient line is not like the one back home at the squadron. Your model aircraft and various requirements might be unfamiliar.

Since the airplane with transparent skin has yet to be built, the preflight inspection is of vital importance prior to any flight in any aircraft. Failure to carry out this vital function has caused accidents in the past and will cause them in the future. Proper supervision and the instillation of a sense of responsibility in both plane captains and pilots will insure better preflight inspections and aid in the elimination of these AVOIDABLE accidents.

In conclusion, it has been noted, after years of study and observation, that night preflights without flashlights are generally more rapid.

Preflighting the Preflighters

The deliberate planting of a dozen discrepancies in an HUS and the checking of 40 squadron pilots resulted in some interesting findings the most significant of which is that the average preflight made by pilots leaves very much to be desired. Here are the facts—the figures speak for themselves:

Discrepancy	*Percent of Pilots Finding Discrepancy*
Dzus fasteners on inverter shield loose.	62
Horn locking pin out but lock wired.	100
Clutch retaining cable disconnected but in place.	83
Rag or rag-bag hung from control cable in cabin.	92
Reversed connections on 3-way pressure switch.	0
Throttle linkage loose (cotter pin out).	92
One servo control disconnected or nut missing.	48
One quick-disconnect on engine off but fixed in place.	87
Taper pin nut loose or off (one on each side of rotor head).	100
Loose wrench on rotor head.	54
Tail rotor gust lock on —One tail rotor pitch change link reversed with counterweight link.	100

1) There were only three discrepancies that 100% of the pilots found:

a. Horn locking pin.
b. Taper pin nut.
c. Tail rotor link on gust lock.

2) There was one discrepancy that no pilot found, except some noted that the lockwire was cut. (Reversed 3-way pressure switch)

3) The next three most missed items were:

a. Nut off lateral servo (48% found it).
b. Loose wrench on rotor head (54% found it).
c. Dzus fasteners on inverter shield loose (62% found it).

4) It is signficant to note that all pilots missed at least two of the above discrepancies. None missed more than four.—*Crossfeed 10-61*

"WALK AROUND INSPECTION"

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SPOT LUCK

or haste makes waste!

After being launched from starboard cat, pilot experienced aileron control difficulties and ejected.

Investigation revealed the pilot was ordered to man an aircraft, his third hop of the day. During final respotting of the deck a tow tractor ran into the port wingtip, aircraft was downed and the pilot was assigned another aircraft. After preflighting and strapped into the cockpit and decision was made to have the pilot take another aircraft which was in a more favorable position for the launch.

As the aircraft was taxiing into position, a signal to spread the wings was given to the pilot as he taxied onto the cat; holdback was attached, bridle attached and control of aircraft passed to the cat officer who signaled for 100 percent power. While the aircraft was being attached to the cat two squadron aircraft checkers were inspecting the aircraft. Both of the checkers, plus the plane captain, saw the wings' unsafe flags protruding from the wings indicating that the manual locking pins were not in place. The senior checker attempted to attract the pilot's attention by flashing his flashlight alternately toward the cockpit and the wing lock flags.

Failing to get the pilot's attention the checker then turned to run to the cat officer and have him hold up the launch. The checker fell down enroute and the catapult was fired before he could get the cat officer's attention.

Result—one aircraft lost, pilot safely ejected.

The CV had no SOP concerning the aircraft checker and Cat Officer. The lack of a good SOP allowed the aircraft to be catted before it was certified as safe for flight by the squadron checker. —Ed Note.

Ground effect to a helicopter pilot can often mean the difference between being able to hack the program with a heavy load or not. It is essential that he understand how it can help him when the power-required curve runs close to the power-available line under a certain set of circumstances.

Here's a particularly good discussion of what ground effect really is. The Center has long been in agreement with the thesis that the "ground cushion" myth must go.

GROUND CUSHION

What Is It . . . Or Is It?

After a rash of landing accidents, the aviation officer at a certain airfield called his instructors together in the post theatre. "These accidents," he said, "have got to stop!"

Casting a stern look over his audience, he continued, "And the first thing you're going to have to learn is how to see those gusts at the end of the runway."

From the darkness at the rear of the theatre, a shrill voice piped: "What color are they?"

Amusing? Well, maybe, but we've all heard and read—and most of us have swallowed—a term that's no less wrong. In fact, it has even wormed its way into training literature. "Principles of Rotary Wing Flight," TM 1-260, September 1957, reads on page 25:

"Normally, the helicopter will tend to sink between the time it moves off the **ground cushion** and the time it picks up translational lift."

From this, you get a mental picture of a compacted

by Major J. A. Gappa, Jr., U.S. Army

canopy of air caused by the churning rotor of a helicopter close to the ground. And with this picture, it's easy to see how you might slide off the side of the slippery mushroom as forward flight begins. Forward flight over relatively smooth terrain, that is, because this concept won't hold water when your aircraft is hovering over confined areas, tall grass, or other types of surfaces—surfaces which should in fact assist in **compacting** air and building a **ground cushion**.

While the term "ground cushion" may help simplify and explain ground effects, it is technically wrong and Army Aviators should know why. This article will attempt to give a straight-forward explanation of ground effects and put an end to the "ground cushion" myth.

First, you should understand several definitions and principles of aerodynamics shown in the following sketches: Figure 1. To produce a certain life coefficient, an airfoil section must have a certain angle of attack between the chord line and the average relative wind. The average relative wind is represented as a vector (V) with an exaggerated angle of attack.

Figure 2. Free-stream velocity is the velocity of an undisturbed fluid (or air) relative to a body immersed in it.

This sketch shows:

1. Free-stream velocity vector at some distance from the airfoil section.
2. Free-stream velocity vector at some distance behind the airfoil section.
3. Average free-stream velocity vector at the aerodynamic center of the airfoil section.

As some arbitrary amount of lift (L) is developed, the direction of 1 changes to 2 behind the airfoil section, and the average of the two becomes the average relative wind 3. The angle (ai) represents the average change in direction of 1 in moving from position 1 to position 2. When the average relative wind is considered, we must, in effect, incline our airfoil by an additional angle (ai) to produce the lift we would have had without downwash. Downwash is the vertical downward component of the airflow induced by, and behind, an airfoil

Figure 3. Thus, (a) must be the sum of (ai) and (ao). Due to the induced angle of attack (ai), any lift developed suffers an unavoidable loss, induced drag (Di), since the lift is measured perpendicular to the average relative wind. The inclined vector (L) has an effective vertical component and a rearward

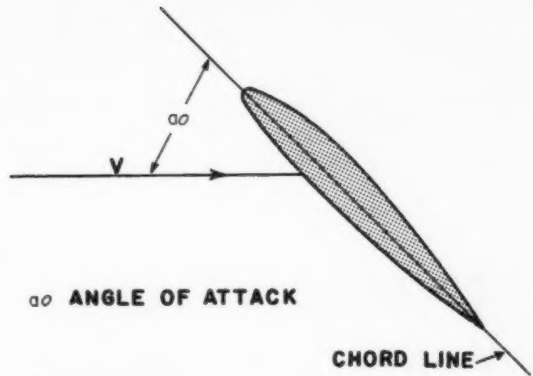


FIGURE 1

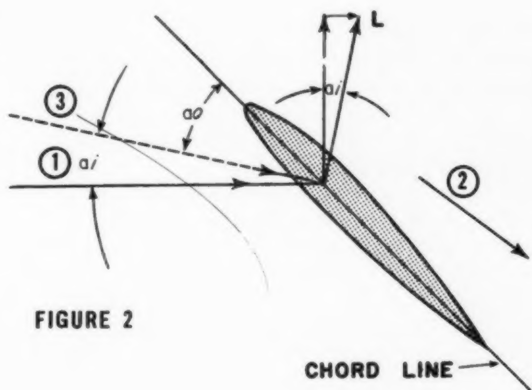


FIGURE 2

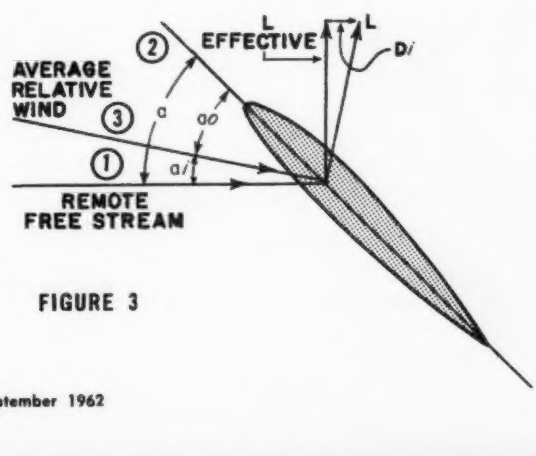


FIGURE 3

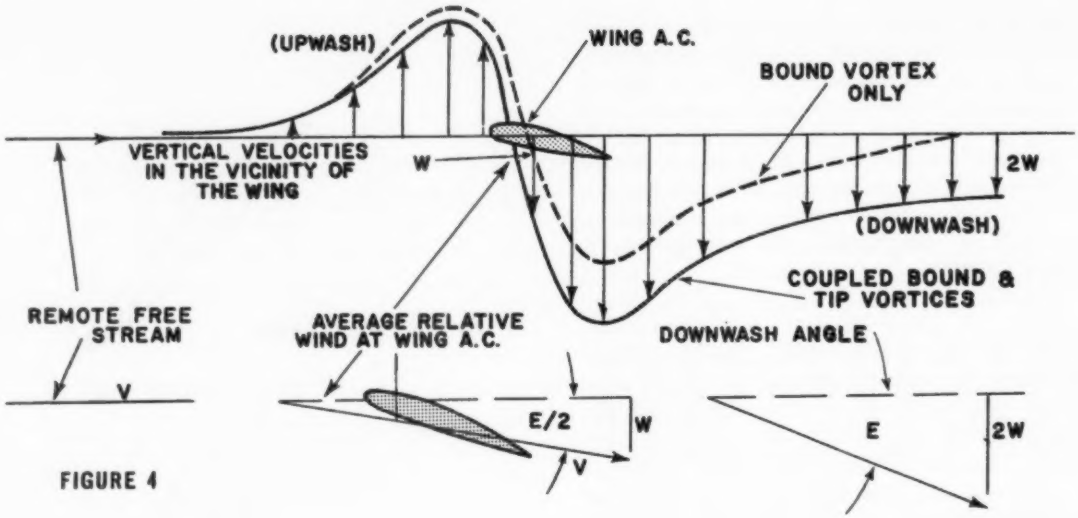


FIGURE 4

induced drag component (Di)—or drag due to lift. If Di could be reduced, we could enjoy increased performance with a corresponding drop in power requirements. But, as long as downwash remains an inherent result of an airfoil producing lift, getting rid of the downwash will be impossible.

Figure 4. Schematic drawing of upwash and downwash, shown as the free-stream flows over the airfoil section. Effects of bound and tip vortices are shown, along with the measurement of the downwash angle at the aerodynamic center of the airfoil section. Under some conditions, downwash can be reduced. One of these, operation of aircraft close to certain types of terrain, leads us into ground effects and an explanation of the nonexistent "ground cushion."

Figure 5 shows that the average downwash is W at the aircraft. At some distance behind the airfoil hection, the downwash is 2W.

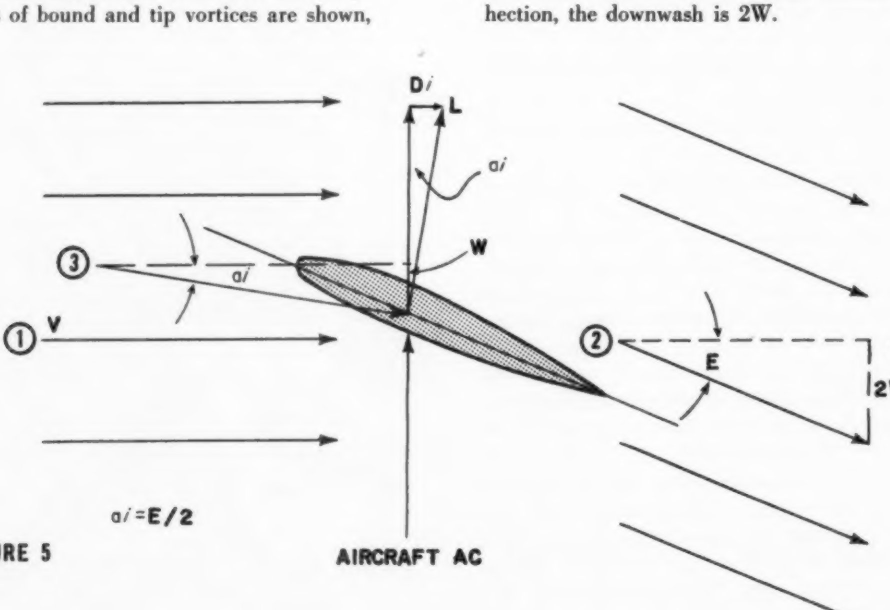


FIGURE 5

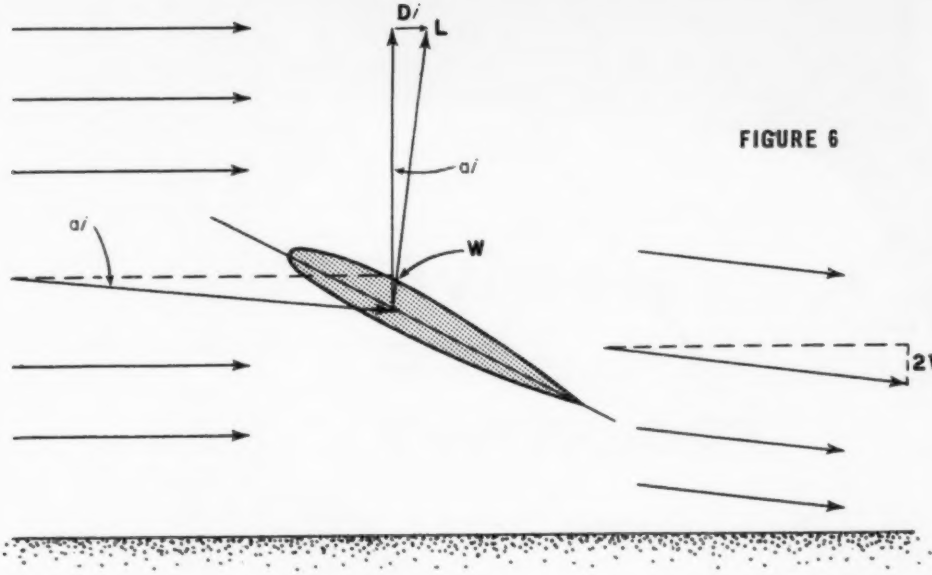


FIGURE 6

Figure 6. Suppose our aircraft (fixed or rotary wing) is operated close to the ground and the downwash velocity is physically restricted by the terrain. This reduced downwash velocity will reduce ai, and as ai decreases, our lift vector becomes more and more near vertical. This, in turn, reduces induced drag. Obviously, with a reduction in induced drag, our power requirements are less. This is the true answer to why we have ground effects—the answer to how, with reduced power, we seem to be riding a cushion.

Why, then, the tendency for a helicopter to sink as it moves forward?

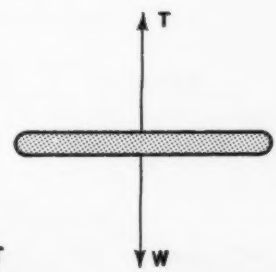
Figure 7 shows that the thrust vector equals the weight vector and rotor lift sustains the weight of the helicopter. When the thrust vector is inclined as shown in figure 8, the effective lift is less than the weight of the aircraft and the helicopter will sink until the thrust increases enough for effective lift to equal total weight. Thrust may be increased by increasing collective pitch, assuming enough power is available, or by acquiring translational velocity and increasing lift through forward velocity, as shown in figure 9.

These same principles apply to a fixed wing aircraft in a level flight, steady rate turn.

Figure 10. To maintain a steady turn, effective lift must equal the weight; and centrifugal force must be balanced by the horizontal component of lift.

Since induced drag is the predominant component of total drag during hovering or slow speed flight, the

FIGURE 7



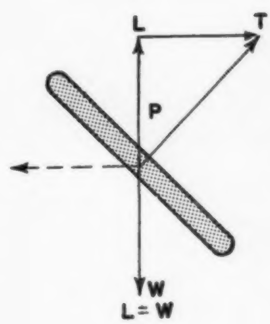


FIGURE 8

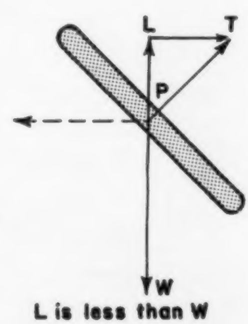


FIGURE 9

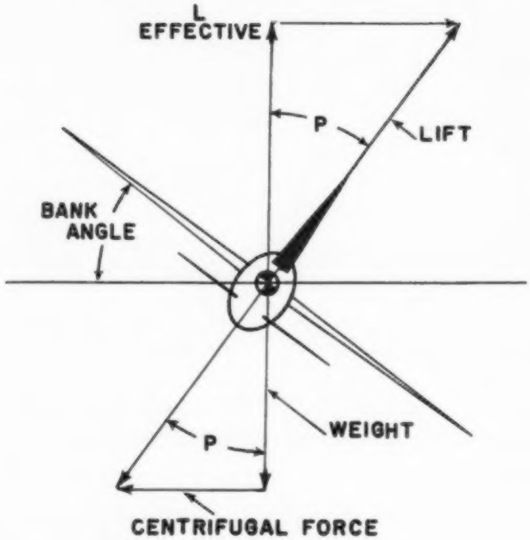


FIGURE 10

effects of reducing induced ground effects, is the answer to why the aircraft has a tendency to sink as we move from negligible forward velocities, where induced drag predominates, to velocities where parasite and profile drags build up rapidly.

In summary, the sensation of "sliding off a ground cushion" is caused by:

Ground Effects—lowering induced drag (drag due to lift) when operating near certain types of terrain and subsequently moving into a region where parasite and profile drag become progressively more predominant.

Inclined Rotor Thrust Vector—which reduces effective lift.

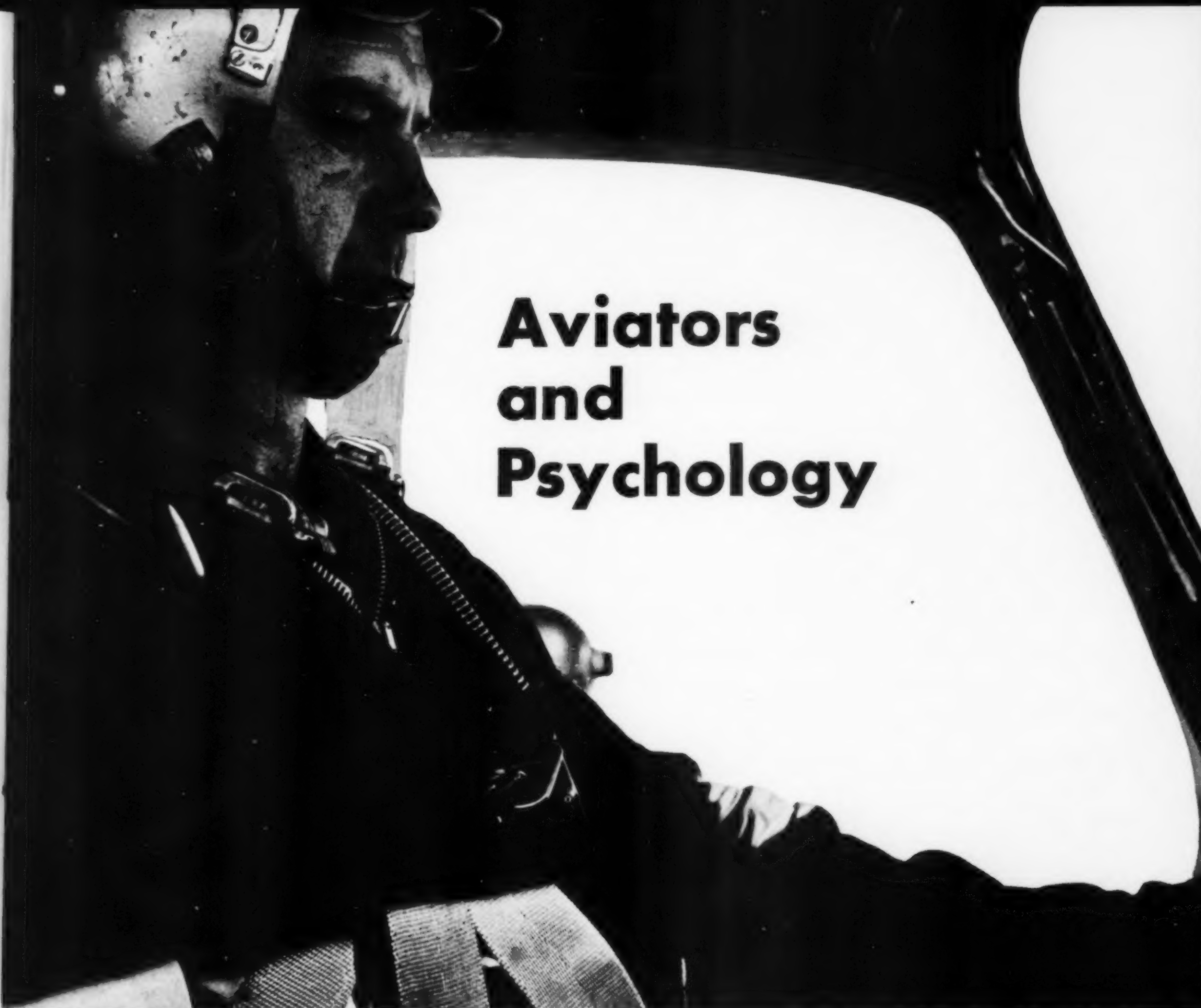
How far above the ground do we find ground effects? One-half the rotor diameter, or one-half the wing span are generally accepted guidelines for noticeable ground effects. Ground effects decrease more rapidly, with height above the ground, when in forward flight than when in hovering flight. The decrease in ground effects is very rapid as forward velocity increases.

To those of you who still insist you're riding a "ground cushion," watch out for that gremlin—the one with the valve remover!—*Army Aviation Digest*

The Carpenter Pick-up

CDR J. M. Wondergem, Skipper of HS-3, who picked up Astronaut LCDR Scott M. Carpenter following his orbital flight in May, reports that he "hovered at an altitude of 50 feet during pickup." CDR Wondergem, who was flying the twin turbine powered HSS-2, said he encountered "no problems in blowing the raft around as were indicated in pickup of Astronaut Virgil Grissom." Astronaut Carpenter stated rescue was most comfortable. CDR Wondergem, his copilot LCDR W. C. Young, and crewman LTJG William Shufelt, "recommend that all helo pilots be again advised of the adverse effects suffered by downed personnel when hover altitudes are lower than necessary."

P. S. Carrier aviators, helicopter pilots and crewmen and destroyer personnel will want to review the newly released Sense Pamphlet PILOT RESCUE FACTS (NavWeps 00-80J-2) for additional tips on the state of the art.



Aviators and Psychology

Before you laugh and sit down at the piano, take a gander at these words from the Coast Guard Safety Bulletin—especially if your cockpit duties require you to fly more than one model of aircraft (like O & R or station test pilots) or if you are transitioning after many years in one model.

1. *Negative transfer is*

a. a permanent change of station which you don't want.

b. habit interference caused by flying too many types.

c. attempting to pump gas from an empty drop tank.

2. *Types of failure of attention are*

a. scratching, thinking about a cool beer and not hearing the XO's command while at personnel inspection.

b. fixation, fascination and distraction.

c. at a pilot's meeting, missing the remarks of the Old Man, the Ops Officer and the unit old-timer because of anticipation of the afternoon's golf match.

3. *Memory is adversely affected by*

a. a hangover.

b. lack of practice.

c. a desire to forget.

This being a discussion of psychology (of sorts), it would not be considered proper to degrade the reader's ego, so regardless of the answers you have selected, consider your score 100 percent. This means that your perceptions are good, judgment accurate

and patience with the writer extraordinary. With these facts established, perhaps you can spare a few more minutes for an amateur discussion of the CG aviator and psychology.

The working routine of the CG aviator is somewhat more strenuous than that of most other military pilots, as most of us have established in discussions with our brothers in sister services. Our routine of frequent duty days, multiple models of aircraft, scrambles, standbys and unrelenting paper-work breeds trouble when driving a flying machine; trouble of the most insidious type, almost a mental carbon-monoxide poisoning process which is upon the susceptible aviator before he realizes it. Let's consider the factors included in the quiz, linking them with the working routine.

Negative Transfer

Negative transfer is habit interference and may apply to differences between aircraft or conflicts in instruments or controls on the panel of a single aircraft. Examples of this are

(1) the difficulty of switching from use of the conventional directional gyro to use of the RMI card presentation, and

(2) differences between two models of aircraft in the arrangement and direction of movement of mixture, throttle and prop controls on the pedestals.

Coast Guard aviators have been subject to habit interference for years from just such causes due to the number of models of aircraft and multiple qualifications. Surmounting the problem of negative transfer requires adequate transition training in each new model, limiting the number of models flown by an individual pilot, and the realization on the part of each pilot when he climbs into an aircraft that he may be subject to the phenomenon.

Failure of Attention

Now, how about quiz question two. Failures of attention may be categorized as fixation, fascination and distraction. Of the three, fascination is the rarest and may be thought of as "situation hypnosis," a state of detachment from the surroundings. Such "removal from reality" was frequently reported during World War II by heavy bomber crews subject to intense danger but unable to do anything about it (heavy anti-aircraft fire at, above, and below flight altitude; imminent danger of death and nowhere to hide). A more common failure of attention is fixation. This is the failure to shift attention, such as devoting attention to one instrument to the exclusion of all others. The third type and most common failure is distraction. It may involve a disturbing factor outside or inside the aircraft or may be due to the pilot's state of mind ("I've got to get to the bank before it closes" or "I wonder if the old man will chew me out because I forgot the camera".) Coast Guard aviators may find themselves in many circumstances of flight when failures of attention are likely to occur. When too many stimuli are presented and too many responses are required, attention failures may help the flight situation deteriorate to the danger point. This could happen to you during a search mission underneath low ceilings while controlling several search aircraft, wondering about the rather sketchy navigation you've been doing and watching that starboard engine's slightly high oil temperature. Pilots on search missions are subject to overloading—overloading leads to failures of attention.

Memory Affection

The third quiz question relates to memory and what affects it. While all three answers are correct, the one inviting discussion is "lack of practice." Practice in aviation is termed proficiency flying and only by regular and frequent practice can real proficiency be obtained and retained. The human memory is a remarkable but not very efficient device; it is affected by many factors such as recency (how recently the last practice took place), active forgetting, mental blocking and distractions of attention.

Studies have established that a clear-cut relationship exists between amount of flying per time interval and accident rate for a diversified group of pilots. With the relatively limited amount of proficiency flying available in Coast Guard aviation, maximum utilization of available time is absolutely required: practice what hasn't been practiced recently, practice maneuvers that might be required under adverse conditions, but whenever possible, practice. Boring holes won't help you make that no-flap landing when a hydraulic failure occurs at the end of a long and tiring flight.

One factor which affects almost all phases of pilot performance in an aircraft is fatigue. Any Coast Guard aviator who has been out of flight training more than six months has become acquainted with the fatigue versus flying problem. Each of us has had the experience of shuffling papers all morning, sitting on the desk all afternoon, and flying all night on the case that broke about suppertime.

Elaborate studies have shown that crew efficiency drops steadily on any night flight, starting immediately after takeoff; timing deteriorates, lower standards of performance become acceptable, attention to instrument indications becomes narrowed and responses sluggish and the crew becomes over-

anxious to land and complete the mission.

These phenomena are more pronounced if the crew is partially fatigued before beginning the flight. There is no pat solution to the problem of fatigue for the CG aviator short of a sweeping revision of CG aviation practices. As this is impossible due to the mission-assigned versus personnel-available relationship, the CG aviator must learn to live with fatigue, and know what effect it can have during a flight.

The discussion thus far has treated some psychological problems which the Coast Guard aviator is likely to encounter as a result of the complex aircraft he flies, his duties aside from flying duties and his general working conditions, each factor interrelating with the others. What can be done to improve the situation, to attack the problems at their source? Probably every aviator has positive ideas on this question. As this subject is certainly one involving flight safety, these ideas could well be submitted. To get the pot boiling, a few ideas are submitted below, not in the nature of recommendations but as *possible* approaches to the problems discussed.

1. A service-wide survey by an appropriate private agency might be considered. Such a survey should compare CG aviators' work load, flying and administrative, against established parameters for general aviation and against practices in other military aviation activities. Particular attention should be given to working hours per day and per week and to opportunities available for rest and recreation.

2. Assignment of non-flying officers (with no previous aviation connection) to aviation units might be considered. Such officers could probably assume the administrative work load of two aviators each, reducing work-load on assigned aviators and permitting them more time for professional aviation development. Also, more lattitude in duty schedules and on-board time during the work week could result.

3. The requirement that a pilot be current in no

more than two models of aircraft might be established. This would enable each pilot to concentrate on the aircraft he will be flying operationally and would reduce the natural desire to be "qualified" in everything at the unit. While a pilot would not have as many current "qualifications," he would have an opportunity to become *more qualified* in the types he does fly.

4. Emphasis could be placed on the "professional" approach to flying. This would include more than the stated desire for such an approach; it would mean concentrated training and education, in the air and on the ground, and would include more standardization; standardization that is both understood and enforced.

5. Opportunity for sports and exercise might be provided as a matter of command policy. Physical fitness requirements could be set up in conjunction with this policy so that aviators would be encouraged to stay in shape and utilize "exercise" time properly.

6. The status of the unit aviation safety officer might be elevated so that he is responsible directly to the CO for aviation safety matters. Carefully defined rules could delineate his responsibilities so that he could truly serve to enhance "mission effectiveness" through a properly conceived and well-executed safety program. Such a program would necessarily include education of flight and maintenance crews on the psychological factors in flying and how to minimize their effect.

The present day Coast Guard aviator flies larger and more complex aircraft than ever before, while carrying out the duty schedule and accomplishing a seemingly increasing paper work load. Under these conditions, unfavorable psychological factors inevitably affect his performance when flying. This situation can result in accidents, directly and indirectly. It is necessary for all aviators to be aware of the entire problem and to think constructively about it. Coast Guard aviation must progress in any direction which will increase mission effectiveness. Management of the man in Coast Guard aviation must be adapted to the modern machines that he flies and changing conditions under which he flies them. ●

Are YOU Qualified For A Navy Air Pilot Certificate ?

Navy Air Pilot Certificates will be issued by the Navy Department to all officers who qualify in accordance with the conditions herein specified. . . .

To qualify for such a certificate, an officer must first make official application, such application being approved by the senior qualified aviator present. The application must be accompanied by a brief written report, by the applicant, embracing the following topics, taken from notes made by him during his course of instruction and revised at the time of application.

a. The principal causes of accidents in aeroplanes and the applicant's personal views as to the best means for providing safety in flight.

b. The advantages and disadvantages of high speed, of wide range in speed, of flying over land and of flying over water.

c. The relative locations of the center of pressure and the center of gravity in a hydroaeroplane or airboat, the location of the lines of thrust and resistance, the effect on the center of pressure of changes in the angle of attack, the effect of longitudinal changes in the center of gravity, the necessity for "banking" and the causes of "skidding" or "side slipping."

d. The phenomena commonly known as "air holes" and the precautions to be observed in turning an aeroplane in a strong wind.

e. The precautions necessary when making a forced landing, in a hydro-aeroplane, both before the wind and against it.

f. The advantages and the disadvantages of the different types of aeroplane motors of which he has knowledge and the principal precautions to be taken in the care and handling of such motors.—*Instructions Concerning Aviation and Navy Air Pilot Certificates—4 April 1913*

FACILITIES

Selected Items From Aviation Safety Council Meetings

Flight Planning Facilities

There is a definite need for standardization of flight planning facilities, equipment and publications within each Base Operations Office. Standardization would lead to better flight planning inasmuch as the proper tools would be provided aircrew members and they would know exactly where to find needed information. Standardization can be achieved without the excessive expenditure of funds.—*CNABaTra*

Mirror Source Lights Too Bright for Night Operations.

The four outer source lights have switches installed to turn them off for night operations. The four remaining lights, if left at the level used during daylight operations, are still too bright. There is a rheostat on the power distribution panel, but due to the location of this panel a public works electrician must be called to adjust the brilliance of the source lights.

Recommendation: That a study be made to re-locate the rheostat so that it may be adjusted by the Runway Duty Officer.—*Kaneohe Bay Safety Council*

You're Invited

A recent incident pointed out the lack of understanding of the abilities and capabilities of GCI sites and RATC Centers. The 679th Air Division and the Jacksonville RATCC, both located at NAS Jacksonville, have invited all pilots in the area to be their guests for a guided tour of their facilities and have their capabilities explained. It was recommended that all squadrons take full advantage of this offer and require each pilot to visit the local GCI sites and RATCC. —*Southern Area, Jax.*

Standby Crew's Quarters

The medical committee reported on the following item:

Adequate sleeping quarters for the standby and ready crews has been under constant study. A temporary arrangement has been made by assigning only three flight crews to each compartment in the barracks. As it stands now, there is no adequate solution readily available as this is a matter of allocation of funds to construct new quarters adjacent to or easily reached from the flight line. A report is being submitted by the Medical Department via the chain of command stating the condition as it exists and with recommendations to alleviate the situation. This will remain as an item of study for the medical committee. —*FAirWingSix*

CHECK RIDES AND FAM HOPS

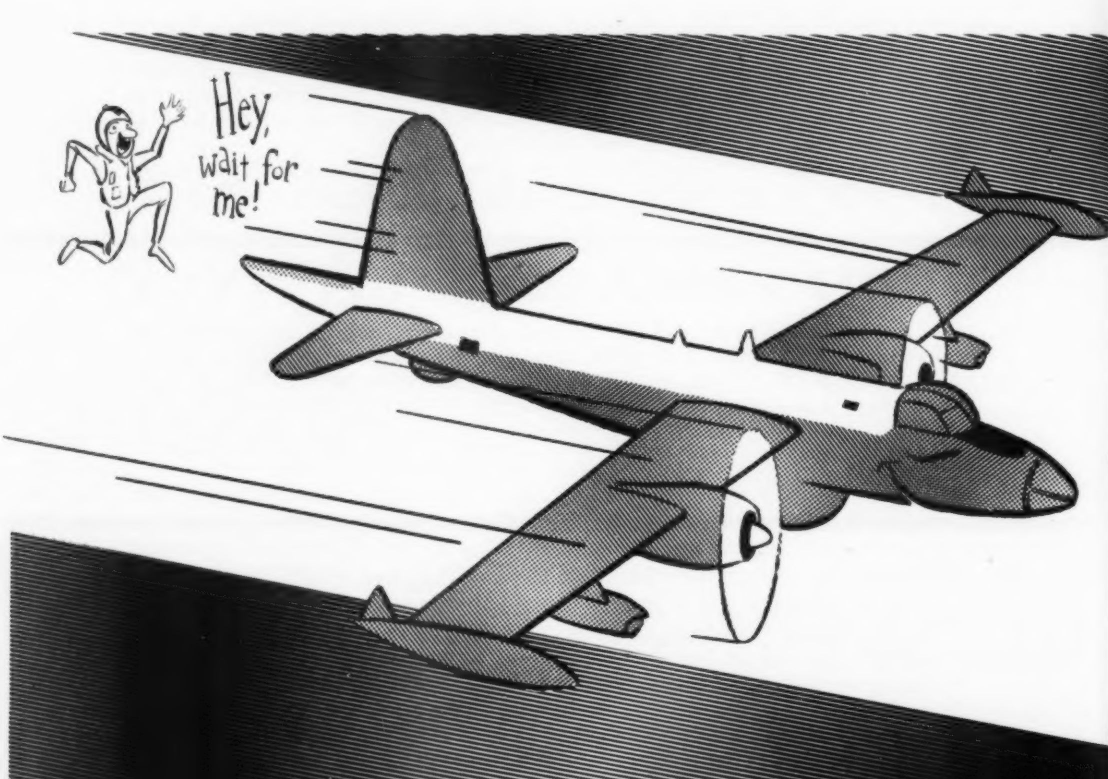
Much ado about instructing problems

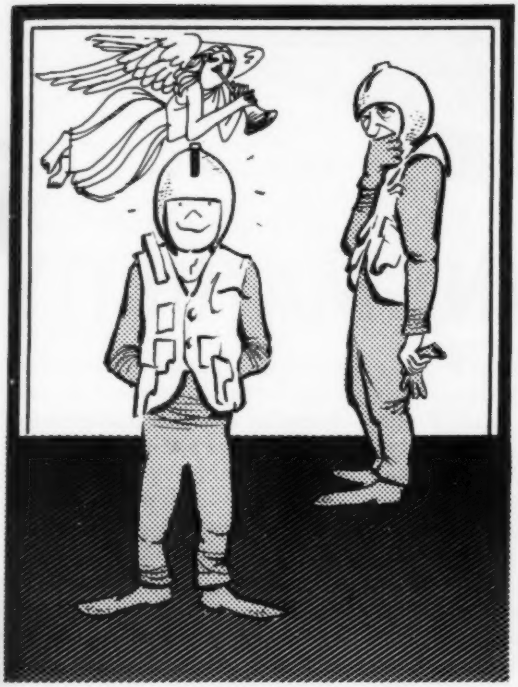
Everybody knows about the check rides and fam hops—Ev-ry-body!

Having been on the receiving end, as check-ee or fam-ee, so to speak, and having sweated through this phase of life successfully, every pilot then becomes a prospective check pilot or chase pilot.

Now suppose you get tagged for a tutoring job and a young (possibly), relatively inexperienced (often) victim is delivered into your hands: If he does not meet either of these standards it's probably due to unfamiliarity or lack of recent hours in a particular model. What are you going to do with him, or more to the point, what are you going to keep him from doing?

Designation as a Naval Aviator gives a certain level of exposure to the Facts of Flight; possession of one or more filled-up logbooks automatically boosts the level of performance which is expected. But remember how it was when you were on the listening end of a check flight briefing? You put your confidence





in the "elder" pilot, trusting his brain and judgment to pull you back from the brink of disaster. No setup or situation seemed too difficult to try, or at least nobody ever admitted it out loud.

The takeoff and landing phases, especially the latter, are more prone to accident or incident with a stranger at the controls. Consequently the question which will loom large in a checkout is wind and runway; how much of each is available? Is the check pilot required to use his own judgment for allowable crosswind component, runway length, . . . , or does the organization provide a guide for these things?

It should be obvious that the maximum crosswind or minimum runway length which can be handled by a pilot experienced in model will be greatly different from conditions that a trainee can take care of. We all know the old gag about needing to log the first couple of hops in a new airplane as "passenger" time. An unfamiliar environment puts us about six feet behind the cockpit after several momentary pauses in reaching for a control and reacting to a visual cue on the instrument panel or ahead of the airplane. In a fast moving situation it is hard to catch up with the airplane, much less stay ahead of it.

So if it's realistic to assume that a "double standard" is needed, one for check rides and one for qualified pilots, is it realistic to quote flight manual figures when a trainee is involved in a landing accident or incident? To say that "proper braking action would have stopped the aircraft on the remaining runway" and follow it with the number of feet in which the airplane *could* have been stopped makes an unassailable argument—for the Accident Board, that is.

For an example take the case of a LTJG with 75 hours in the right seat of a P2V who climbs into the left seat for the first time. After two hours aloft the aircraft comes back home and the LTJG prepares for a full stop landing. The wind is four knots and the runway is 6000 feet long. He touches down long but still within the first third and then can't get reverse pitch going for him. This several seconds of fumbling has cost him valuable runway so then the instructor pilot gets on the brakes. After a couple thousand feet of heavy braking both tires have blown and the P2V still has enough momentum to go off the end. A fuel fire caused strike damage.

Following the accident an opinion was put forth that the length of the runway was too short for initial checkouts in P2Vs. Since an 8 and 10-thousand foot runway were available in the immediate area this opinion may have some merit.

In another case a pilot on his fam no. 2 in an FJ-4 had completed four touch-and-go landings on a 5000-foot runway then got set up for his second full stop in the airplane. Wind was 10 to 14 knots. Approach speed was satisfactory with touchdown point between 500 and 1000 feet from the threshold. However the pilot was not satisfied with his deceleration in the rollout and took the field arresting gear rather than chance going off the end.

At his stage of training this was probably the wisest choice—except that not all agreed. One comment on his performance was "if the pilot had used aero-dynamic braking earlier in the rollout he would not have had to use the arresting gear to stop *on this short* runway" (italics supplied).

One other example may suffice to illustrate how a student can get boxed into a situation which he is unable to handle. On his first P2V single-engine work the pilot failed to take a moderate crosswind into account and his landing was a yawing, bouncy thing which angled him off the runway. But he was lucky with power and got airborne without damage—until he got excited and pulled the gear up too soon. The plane settled which led to four missing prop tips on one engine. Thereafter the squadron set up the maximum crosswind component allowable for initial checkouts.

ANYMOUSE

INSTANT MATURITY

I TOOK off in an F9F-8T at 1234 on a Mudflat departure. After takeoff I went IFR at 2000 feet and stayed in the clouds during the climb. Approach control cleared me to commence the 30-mile arc and no turbulence of consequence was encountered until completing this arc. At this time ATC requested my present altitude and when I answered 26,000 feet, they instructed me to continue climb to no higher than 35,000 until further advised.

Now I observed several bolts of lightning very close. All radios and instruments were working normally but suddenly the airspeed, which had been indicating 280 knots with pitot heat ON, started decreasing rapidly. A cross-check of instruments revealed wings level 500-foot rate of climb. Forward stick movement did not have any effect on the aircraft. Severe turbulence then placed the aircraft in several unusual attitudes and out of my control.

I had difficulty watching the instruments as my charts, nav bags, survival knife and a lot of dirt was flying around the cockpit from the alternating positive to negative Gs. There was a lot of noise from hail and the airspeed read ZERO. With my left hand I felt the ejection face curtain. The altimeter needles were moving up and down too rapidly to interpret so I had to use the 10,000-foot barber-pole indicator to determine my altitude. I decided to eject at 10,000 feet if control was not regained.

Finally I figured out what was happening (I was in an inverted 60-degree nose-down attitude) and was able to read 16,000 feet on the altimeter. I rolled the aircraft upright, reduced power as the airspeed was then back up to 320 knots and recovered at 10,000 feet. At this time I was on the 170-degree radial at the 28-mile fix and approach control was asked for a straight-in for runway 35. This was approved and I broke out VFR at 1500 feet above the ground. The field was in sight at the 7-mile gate and landing was normal at 1303. The accelerometer indicated the aircraft had been subject to 5 positive and 1½ negative Gs.

Although this pilot only logged .5 it probably seemed longer. A thunderstorm lay directly over his climbout sector and it contained enough hail to cause an estimated $1000 damage to his airplane. Knowing his limited flight time (300 total; 100 in model) you might agree with the Safety Officer's comment: "The pilot exhibited outstanding self-discipline and training in effecting a recovery after he had lost complete control of the aircraft due to severe turbulence in a thunderstorm."—HEADMOUSE

Feather Number Two! ! ?

While instructing in the S2F a few years ago, I gave a single engine to a student as he was practicing a turn pattern. Seconds later, with the aircraft on its back, I managed to turn the fuel selector on again. We recovered from the maneuver after losing 4000 feet and I vowed to refrain from giving a single engine while in a steep turn ever again.

Some months later, while practicing stalls and slow flight, I gave a routine single engine. In just a few seconds we stalled and fell off in a flat spin. I turned the fuel selector back on and by use of the rudder assist and full power from the engine on the inside of the spin, we recovered after losing 5500 feet. That was the last single engine I've ever given in slow flight.

The next spring, while flying along straight and level at 7000 feet, I reached up and turned off the right engine fuel selector. My student unhesitatingly carried out single engine procedures. After agreeing that the right engine was dead, he reached up and feathered the left engine. I immediately turned the right engine fuel selector on, reduced power and unfeathered number one. We lost 2000 feet. I then decided to give single engines by securing the fuel selector to the port engine so I could protect the right engine feather button.

Later in the spring, I initiated a single engine practice by securing the port engine fuel selector. My student carried out the procedures perfectly until it came down to turning off the mag. He reached up and turned off the mag to the good engine. With cat-like alacrity, I reduced the throttle and turned the mag back on. We lost 1000 feet. From that time on, I have protected the right engine and associated controls like a watchdog.

Summertime was upon us as I gave a bright prospect a routine single engine. I sat there and marveled as he methodically carried out the checklist with professional adroitness. When it came time to return the engine to the line things went to pot. The feather button had never popped out after the engine was secured and all the oil had been pumped into the engine from the tank. My bright prospect took us home single engine. Thereafter, I checked to see that the feather button returned to neutral within 10 seconds of being actuated.

Came the fall and on a climbout from the night bounce pattern backfiring and associated swerves served notice that everything was not normal. As the rudder assist was turned on and the props shoved forward, the backfiring ceased. The student pilot, certain that backfiring had come from my engine, added full throttle to number one. I looked at the gages, saw 50 inches on number one and 30 inches on number two and asked the pilot if he was holding left rudder. He confirmed that he was holding left rudder and I announced, "I'll feather number two! !" Home field was four miles ahead and we started a straight-in to the duty runway. Over the threshold, number one engine froze from oil starvation. We glided to a landing and a short while later discovered we had made it with the aid of an eight-cylinder engine after feathering the good number two engine.

In early December, while flying along in very cold air, I was demonstrating the use of the de-icing equipment. With all systems going, I gave the pilot a single engine. He secured the port engine with great skill. Suddenly, the ICS and all radios went dead. I had put all that electrical load on the starboard D. C. generator and it had sheared a shaft. We had a dead battery, too. After landing single engine I decided to check the electrical load before giving single engines.

I then went on Christmas leave. When I returned, I was made a ground training instructor (and just when I had learned all the angles to giving a single engine!).

Wants QUALITY CONTROL Organization Mandatory

Dear Headmouse:

After reviewing the Safety Center's tape-slide presentation that was distributed during 1960 and reading the concepts and philosophies in APPROACH of Apr. '62 plus the publication "Mech 61" on Aircraft Accidents/Incidents Involving Maintenance and Servicing Errors, I find many outstanding words of wisdom. The findings, analyses, conclusions and recommendations really hit home.

Having spent many hours reviewing your fine training aids with maintenance officers and the working personnel, with an aim to improve local conditions, it is still impossible to get our Quality Control Division properly functioning in accordance with local requirements as outlined in BuWeps Instruction 5440.2.

Our main problem area is not enough personnel. I feel that our problem will never be corrected until enough qualified personnel are assigned to meet all our requirements and operating conditions.

Organizations like ours operate six types of aircraft and are required to support many types of transient aircraft plus Class "C" shops for all systems. This, I feel, is all the more reason for a need of highly qualified and motivated personnel in both numbers and skills. Quality Control is supposed to be made available at all times maintenance is being performed. And more so, when the job is in its planning stage and follow-through. Q.C. insures adherence to proper procedures, to latest publications and that adequate training is provided.

Shortage of personnel is keenly felt because programs such as Component Repair, which was designed to save time and money, requires more repair work at the Class "C" level. Consequently added man-hours, added paper work to screen repair work and added training are needed to keep high cost equipment in good condition.

How can you have professional maintenance when personnel are training for advancement in their rate, studying training courses, plus trying to keep up with latest technical publications pertaining to their rating and then are required to do work which they are untrained for? *Example*—ADJs assigned to Recip organizations with little or no jet requirement. Conversely, ADRs assigned to jet outfits. Where does Quality Control go from here?

There is a real need for a guide to organize standard Quality Control Organizations.

I would like to propose a recommendation that at the next review of NavWeps Inst 5440.2, the section on Quality control spell out requirements as outlined under "Recommendations" in "Mech 61", and APPROACH of Apr. '61, page 13. At that time assure that frank comment will not result in bad fitness reports for Quality Control officers now or in the future.

Requirements should be spelled out as to the numbers, skills and rates which are to be assigned to the Quality Control Division. Allowances should be made for Class "C" shop work and when more than one type of aircraft is assigned to an organization.

If something in this nature is not adopted soon, I feel maintenance errors will be even higher. This a personal viewpoint from a Quality Control CPO having a desire to have the best maintenance and finest Quality Control possible within his unit. I also feel that such provisions will keep more trained petty officers in the service a few years longer and put to good use the training that these people have received.

A QUALITY CONTROL CPO

▶ Chief, it appears the situation will become worse with the exodus of trained people getting out on 20 between now and 1965.

If predictions are true, the level of service experience will drop to an average of less than four years —hardly enough to serve an apprenticeship in the Navy much less enough to become a skilled technician on sophisticated aircraft and missiles.

In light of this trend, effective quality control people are the only hopes in averting costly maintenance errors and accidents. If units continue to bypass this "last chance" screening they are destined to failure. The analyses, findings, conclusions and recommendations resulting from the studies you mentioned support your beliefs most emphatically. Hope that all concerned take notice.

Very resp'y

Headmouse

Flight Clothing

Dear Headmouse:

I am a helo driver aboard a carrier. We have a happy day when the COD (TF) comes aboard with that mail from home. And we are only too happy to fly plane guard for that flight as we want that old mail aboard safely. But here comes the discouraging part to me.

I see the COD pilots fly aboard the carrier not wearing hardhats and many of them only wearing street shoes, no boondockers. All they have on is a flight suit and a baseball cap. All the S2F pilots aboard this ship wear the prescribed flight gear and they fly the same pass and land on the same deck as the TF.

I don't feel the COD drivers are complying with OpNavInst 3710.7A and more important they are not looking out for their own safety. Their mission may be to only carry passengers and mail but this mouse would like to have them around to pick up if they should ever be unfortunate enough to go in

Have you a question? Send it to Headmouse, U.S. Naval Aviation Safety Center, Norfolk 11, Virginia. He'll do his best to help.

the water. And that old hardhat might save them for a helicopter pickup.

Please publish this for the benefit of all those hotshot COD drivers who feel that survival equipment is for somebody else. We want them around to see that the mail comes through.

ANYMOUSE

▶ You are absolutely right in your reference to the provisions of OPNavInst 3710. 7A which states in section VI, paragraph 3g under Safety and Survival, *Protective Helmet*: "The latest available approved type protective helmet should be worn by all crewmembers of carrier type aircraft. . . ." In the same paragraph it further states under *Shoes*: "The wearing of low cut shoes by crewmembers, which may be lost on bailout is to be discouraged. Sandals or moccasin type foot gear should not be worn inflight. A high top shoe with good retentive features is recommended. . . ."

Those COD pilots are not only violating an OpNav directive, but are needlessly risking their own lives. The Safety Center files have numerous recorded instances in which a Medical Officer has stated that a pilot owes his survival of a particular crash to the fact that he was wearing a hard hat.

The COD outfits have an excellent reputation throughout both fleets for the manner in which they carry out operational commitments involving both passenger and cargo flights. Perhaps your little reminder will jack up those who have tended to be a little lax in this regard.

Very resp'y,

Headmouse

Rocket Jet Fittings

Dear Headmouse:

Here in Fightin' Photo Sixty-Two we have performed some experiments with the rocket jet fittings and have come up with a few ideas which may be of of interest and use to your readers.

We conducted our experiments by suspending the pilots in full flight gear and wearing water-soaked gloves. We found that if both upper fittings are released simultaneously there was no problem.

To spice things up a bit we had some of the pilots limit themselves to the use of one hand. (This situation recently occurred in an F8U overwater ejection.) We found that with all the tension on only one riser, as might occur on a dragging chute after the first fitting is released, things are not so simple. The release won't release. The reason is that every pilot concentrated on depressing the release buttons. When this didn't do the trick the pilot merely pressed harder on the buttons with the same negative results. However, we discovered that by normally depressing the buttons while exerting a *lifting force*, the fittings came apart quite readily.

We tried all combinations of left fitting first, right fitting first, useless left arm and useless right arm, with complete success. The method of grasping the fittings advocated by our squadron is illustrated in the enclosed photograph. It provides for normal release button depression and maximum force and leverage on the release mechanism.

In addition to the above pilot training we have stringent Quality Control on weekly lubrication of the fittings and have made a sticking or stiff fitting a mandatory "down" gripe. Until a new type fitting is issued we believe that this will preclude the problem of a pilot being unable to get clear of his chute.

F. A. LIBERATO, LCDR
VFP-62 AVIATION SAFETY OFFICER

▶ Your experiments are noteworthy in that they present techniques that may facilitate the release of the Rocket Jet fittings. From a training standpoint, these experiments are excellent in that they familiarize pilots with the working of the fittings and may trigger off new ideas in the minds of pilots and other APPROACH readers. However, there are several points we would like to make:

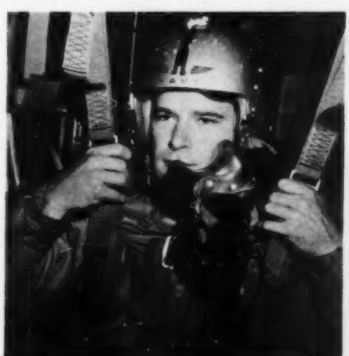
- Experiments of this kind are relatively incomplete in that no opening shock is exerted on the fittings prior to the attempted release.
- Usually, the suspended position is not the position in which the releases will be actuated during the actual silk letdown.
- Although your gloves were wet, the fitting and harness were not.
- Regarding "weekly lubrication of the fittings," BuWeps Aviation Clothing and Survival Equipment Bulletin 50-61 states in paragraph 4-b "*Lubrication*—None." On a recent liaison visit to the Naval Parachute Facility at El Centro, NASC representatives were advised that NPF does not recommend lubrication of any type for Rocket Jet fittings.

The need for an easier actuated release is recognized; consequently, new releases are under development and some are in the evaluation stage at this time.

Your interest is highly commendable and your letter is being forwarded to BuWeps and NPF recommending further evaluation of your tests and techniques.

Very resp'y,

Headmouse



RIGHT

WRONG
NOTE POSITION OF THUMBS

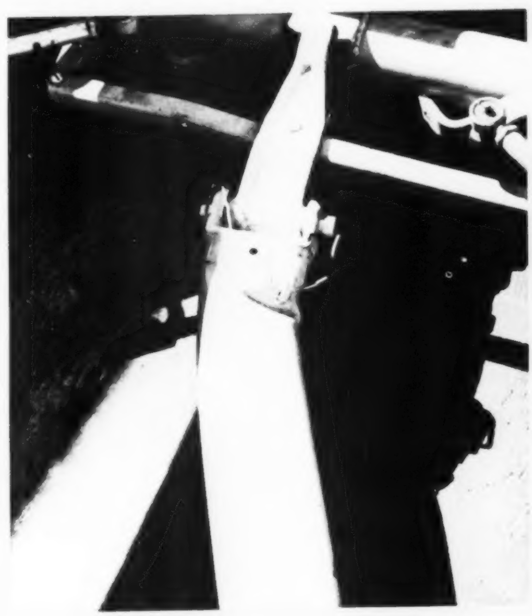
MUGS WAS HERE

The hurrier he goes,
the behinder he gets.

Ooops! Too fast!

What? $4,700 to fix!

Ooops! Too short!



Ooops! Too sharp!

they came from a destroyer in the area. After several orbits one of the pilots saw another flare go off and requested permission to investigate. He and the pilot of a second helo proceeded toward the area. When the survivors were spotted, two smoke lights were dropped. The first helicopter pilot reported to the carrier that he was rigged for rescue and turned into the wind for the transition. Realizing at this time that the destroyer was approaching with searchlights in the vicinity of the survivors, the helicopter pilot broke off his approach. The two helos set up an orbit about the destroyer and reported the progress of the rescue to the carrier.

Back in the water the men could see the carrier. They successfully fired three out of four flares and, another flare when two helicopters approached. The helicopter pilots later reported that the flares were "an outstanding signal device."

Sighting the destroyer heading for them some 300 yards away with searchlights trained toward them, the survivors began to blow their whistles and wave their flashlights. The pilot's flashlight flickered once, then went out; contact between the battery and bulb was poor. The orbiting pilot reported that the one-celled flashlights, though much weaker than the signal flares, were readily visible from a distance of one mile and would have provided a good reference point for helicopter rescue. The survivor's orange flight suits appeared yellowish white in the search-light beams.

Some of the crewman's life vest dye marker which leaked out was readily spotted in the searchlight beams by destroyer personnel.

The destroyer was downwind from the survivors. As they attempted to swim toward it, the ship drifted away faster than they could swim. The destroyer skipper maneuvered for a favorable position to put swimmers in the water to make a ship recovery. With the sea running as it was, he decided boat recovery too dangerous.

Two swimmers with ropes went over the side and towed the survivors to the ship. The pilot discarded his helmet and advised the crewman to do the same. The copilot had taken his helmet off before escaping from the helicopter. Considering the running swells and 6 to 8 foot waves smashing the side of the destroyer, the survivors would have been wiser to have retained helmets for head protection during the rescue.

"I think the worst part of the whole experience was trying to get aboard the ship," the crewman later stated. "There were now five of us in the water and three lines. The men on the ship were trying to pull us aft and we all seemed to be getting bounced around and tangled. I finally got back by the cargo net and grabbed it. With the ship's rolling and all, I got dunked pretty thoroughly several times before I started climbing up the net. When I reached the top I just couldn't go any farther and someone pulled me in."

The pilot and the copilot were pulled aft to the cargo net ladder on lines and climbed aboard. Total time in the water was 43 minutes. Getting the survivors aboard took 10 minutes from the time the lines were thrown out. The copilot noticed for the first time as he was boarding the destroyer that his right thigh was aching and bleeding. The men stated that they did not realize how fatigued they were until they were safely aboard.

Among the recommendations of the Aircraft Accident Investigation Board were:

- That all pilots and crewmen keep protective helmets on until safely aboard the rescuing aircraft or vessel to prevent possible head injury during actual rescue. In addition, the helmet's protection in the event of fire on the water cannot be overlooked.
- That a low profile raft pack which can be worn by helicopter pilots and crewmen must be developed as an urgent necessity.
- That more frequent inspections of existing PR-2 rafts be made to insure that all connective devices are in good working order.
- That at the earliest opportunity a signal flare demonstration be arranged at night for the force while at sea so that pilots and watch standers will more readily recognize a night flare when they see one.
- That should a helicopter be used to effect a night rescue, all surface units be advised to refrain from using searchlights while the helicopters are in the rescue area.
- That all pilots and crewmen be rebriefed on the necessity of conserving their strength as much as possible during the wait for the arrival of the rescue units in the event a crew does ditch.

Commenting on the rescue phase, the AAR observed that "the prompt arrival of the rescue destroyer on the scene proves the validity of having a rescue destroyer on station during night operations constantly monitoring aircraft frequencies." Considering the "normal confusion in the water" and the fact that the survivors had to swim upwind a sufficient distance to clear the gasoline covered area before igniting their flares, the board did not feel the time from accident to first flare sighting excessive. Nor did the board consider the time from flare sighting to actual rescue excessive "in view of the high swells running which required more prudent seamanship on the part of the rescue vessel than would be required were the seas calm." ●

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VERTIGO

The weather in the letdown area for the night instrument training hop as reported by NAS was 2500 feet scattered, occasional broken patches of cumulus clouds, tops of 6000 to 8000 feet scattered rain showers. Visibility was an estimated 15 miles lowering to a half mile in showers. There was no moon. Except for lights along shore in the north, the horizon was not readily discernible below the clouds.

The two FJ-3Ds flew simulated instruments while returning. About 30 miles out the flight leader commenced a gradual VFR letdown in low patchy clouds for entry into the traffic pattern. As the letdown had been rounded out and the flight was nearly level at 380 knots, the wingman re-

ported a bright light in his cockpit. He requested the lead so that he could take care of it.

Passing the lead to the wingman with a radio transmission which was acknowledged, the flight leader slid back to a left wing position. A half minute later in a level attitude, the flight entered a rain shower and then clouds at 5000 feet. The second FJ was able to stay on the lead plane during a starboard climbing turn but the leader reversed course to port, appeared to add 100% rapidly and pulled away. The second pilot then leveled and went on the gages with a radio transmission which was acknowledged. Going on 100% and climbing to get on top of the clouds, he broke through at 8000 feet. On top in the clear, he went into a port orbit to look for the other aircraft. A few minutes later he saw it come out on top of the clouds, then disappear nose down again. Here is his account of ensuing events:

"At this time, he came up on the air and said, 'I've got vertigo.' I said, 'Go on the gages.' No reply. Shortly thereafter he came out on top of the clouds again. I gave him my position from him and he replied that he didn't have me, then said, 'Boy, I've got it bad.' Almost instantly he went into the clouds again. I repeated about five times-'needle-ball, altitude and airspeed.' I heard no further transmissions from him even though I called him repeatedly." Switching to Guard, the pilot transmitted Mayday with range and bearing, also the information that the other pilot in the flight had reported vertigo and was out of communication. Remaining on station until his fuel state reached 1500 lbs., he was relieved by an R4D. Search results were completely negative.

The reporting flight surgeon cites vertigo as the direct cause of this accident. Several conditions conducive to the development of vertigo existed in this accident set-up:

- Planned night VFR flight but unexpected encounter with IFR conditions and alternating contact-IFR conditions.
- Bright light of unknown source in the cockpit which constituted a distracting factor and interfered with the pilot's orientation in space and possibly with his ability to see his flight instruments. (The source of this bright light was thought to have been the life vest flashlight which might have been turned on by rubbing the parachute shoulder harness as the pilot moved.)
- Past experience with what the pilot had considered a "faulty gyro" and therefore possible lack of confidence in the reliability of his flight instruments.
- Possible Coriolis effect resulting from an attempt to locate the source of the bright light in the cockpit.*

The simplest and best rule in a vertigo situation is *ignore your sensations and believe the instruments.*

Man maintains his equilibrium by a combination of sight, muscle sense and the vestibular sense mechanism in his inner ear. When the body is rotated and visual clues are lacking, the brain receives false messages as to the body's orientation in space. This causes vertigo. Your flight surgeon can fill you in on various conditions which are conducive to vertigo.

Because vertigo is caused by a normal physiological response of the human body, little can be done to prevent it. Armstrong in his book, *Aerospace Medicine,* indicates possible areas for improvement: ". . . the approach to the problem appears to lie in the realm of improved aircraft and aircraft instrument design and better and more training of the individual. Aircraft with increased stability would be of considerable benefit as would a simplified cockpit layout and a flight instrument presentation which can be more quickly and easily grasped than that now available."

The simplest and best rule in a vertigo situation is *ignore your sensations and believe the instruments.*

In the following vertigo case, the pilot rapidly evaluated his situation, ejected at 1800 feet and lived to tell the tale.

Weather was 1500 feet scattered, 2500 feet overcast with tops at 3500 feet and visibility 5 miles in light ground fog. After takeoff the pilot accelerated to 340 knots below the scattered layer and established an approximate 10-degree bank left

* *Coriolis effect:* Perhaps the strongest and most uncontrollable vertiginous response of the vestibular apparatus is response to coriolis acceleration. The movements responsible for this type of stimulation arise when the body is in rotation with the airplane and the head is moved voluntarily out of the plane of rotation. The motion is strongest when the head movement is at right angles to the plane of rotation. Such a situation arises during a spin when the head is moved up or down, or from side to side.—USAF Flight Surgeon's Manual

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turn. He transitioned to instruments and began to climb at 6000 feet per minute. He was still in a shallow climbing turn when he suddenly burst out on top of the extremely dense overcast layer. Blinded by the brilliant sunlight, he lowered his helmet visor with a sharp downward motion of his head producing the coriolis effect. He was struck by a severe and incapacitating sensation of spinning around the instrument console. Here is his description of the situation:

"Suddenly I broke through the overcast into brilliant sunlight. Things got hazy and I felt funny. I lowered my visor (with a sharp downward motion of the head) and started getting vertigo. I heard departure control saying something over the receiver. I remember transmitting 'I have vertigo very bad.' The vertigo was so bad that I felt that I was on the verge of passing out. It seemed that my body was rotating around with my head as the axis. I learned forward in my straps to concentrate on the attitude gyro. I seemed to see that I was nose-high with left wing down. Trying to correct the attitude to no avail, I entered a stall and what felt like a spin. I could not focus on anything or get any attitude reference in my state of vertigo. I remember pushing on the stick to try to get the plane out of the shudder. I then realized I was back in the overcast. Knowing I had less than 3000 feet of altitude, I ejected . . ."

Increasing the pilot's susceptibility to vertigo was the fact that he was flying with nasal congestion from a slight cold.

LOST HORIZON

In the following case, a malfunctioning vertical gyro indicator initiated the sequence of events that led to the pilot's ejection.

The lieutenant was scheduled as part of a two-plane night intercept mission which was uneventful until return to marshall point. As the flight leader broke, the LT noted that the VGI on his FH was stuck in a 30-degree right bank position. Informing the flight leader of his difficulties, he requested that he delay letdown until they could rendezvous and make a section CCA. Rocking his wings not only failed to break the VGI loose, but increased the error to 60 degrees right bank. The LT then decided to ignore his VGI. Using the flight leader's formation lights, he concentrated on joining up with him. After join-up, he reported that his radar horizon was working satisfactorily.

A CCA descent was made and everything went smoothly for a time until seven miles out. At this point the flight leader asked the LT for his fuel state. After checking and reporting his fuel, once more the LT had to adjust himself to a visual frame of reference. Shortly after this he started feeling uncomfortable then began to experience vertigo. At 4 miles, 600 feet, 145 knots, he asked if the flight leader was in a right turn. The flight leader answered that he was not, that the LT was high.

The LT began cross-checking his instruments and although his radar horizon was approximately level, his RMI was moving rapidly indicating a turn. He then broke away to the left and above the flight leader and attempted to level off at about 1200 feet. Losing all faith in his remaining instruments, he stared out of the cockpit to try to find the horizon. Although surface visibility was 8 miles, haze conditions aloft reduced oblique visibility and obscured the horizon. The flight leader saw the LT cross over him in a left turn, lighting his burner. He directed the LT repeatedly to roll his wings to the right but the LT did not acknowledge and continued his left bank.

Joining on the LT to render what assistance he could, the flight leader observed that the LT seemed to have his aircraft under control although still in a left turn. He requested the LT's fuel state which was given. The flight leader then asked several times for the LT's heading but received no reply. The LT recalled afterward that while looking for the horizon, he felt "as if the bottom fell out." As his altimeter moved rapidly through 1000 feet, he made the decision to eject. . . . He was successfully rescued by a motor whaleboat from the aft plane guard destroyer.

The investigating flight surgeon considered the possibility that, in addition to the "scan-shift" vertigo discussed above, the sudden quick movement of the pilot's head when he checked the fuel gage could have contributed to his disorientation.

• *Headmouse grants the pilot, in the last case, one free pucker and a double clutch—recovery on partial panel at sea at night is mighty, mighty rough, if not almost impossible. It might also have helped if the FL hadn't bugged for the fuel state, which reminds us that in emergencies all people on the air often tend to ask too many questions of busy aircrews.*

LAND SURVIVAL

by LT. William C. McDade, MC, Flight Surgeon, VP-17

LT McDade tested the land survival characteristics of the Mk IV anti-exposure suit and other allied winter flying equipment at the Arctic Survival School, Eielson Air Force Base, Fairbanks, Alaska, for five days in January of this year.

The purpose for wearing the Mk- IV anti-exposure suit and its water survival characteristics are generally well known, the suit being mainly designed to protect the wearer from the extreme cold of the water if forced down at sea.

However, relatively little information has been published regarding the characteristics and usability of the Mk IV suit in a land survival situation. All pilots and crewmen flying patrol type aircraft in the Alaska area wear the Mk IV suit. Since much of the flying in Alaska is over land or within proximity of land, survival on land may be considered a realistic possibility.

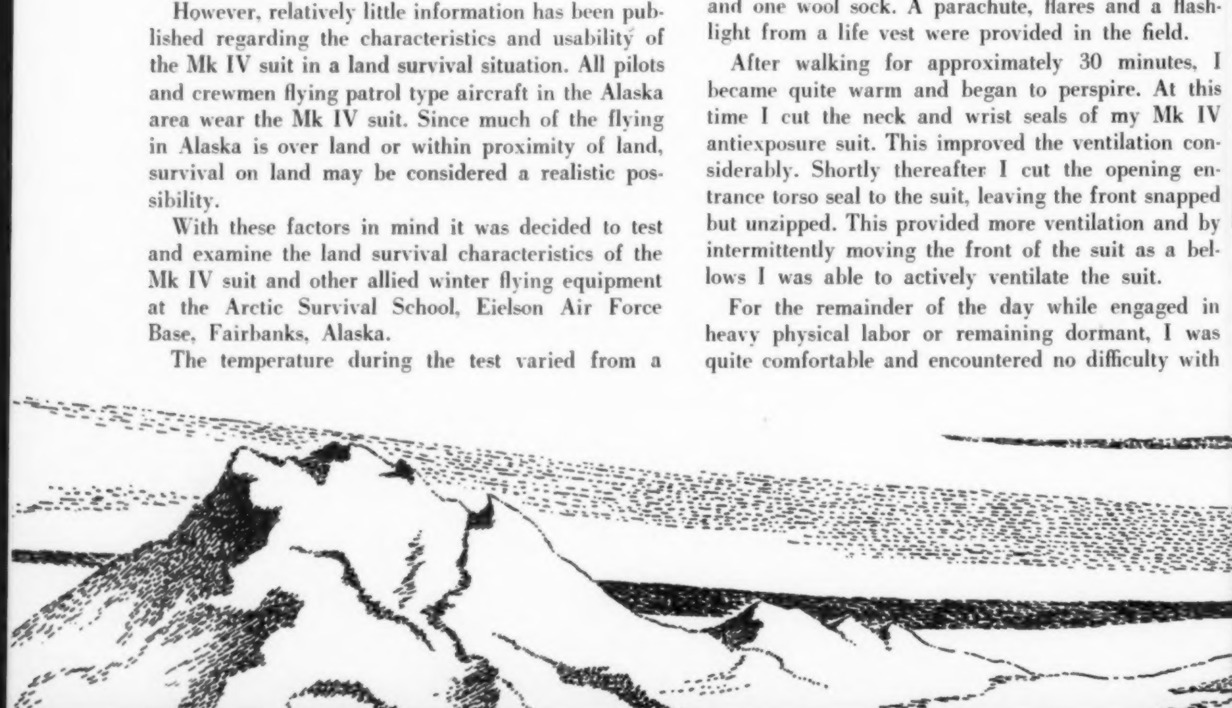
With these factors in mind it was decided to test and examine the land survival characteristics of the Mk IV suit and other allied winter flying equipment at the Arctic Survival School, Eielson Air Force Base, Fairbanks, Alaska.

The temperature during the test varied from a high of 15° F. during the day to a low of 25° F. below zero at night. Winds were recorded between 2 and 4 knots. The snow depth during the test average between three and four feet.

I walked in to the survival area clothed as I would be while flying under normal conditions in Alaska during the winter months. This clothing comprised a complete set of thermal underwear (although the majority of squadron personnel fly in cotton underwear. undershirt and shorts), winter flying suit, Mk IV anti-exposure suit, detachable winter hood, winter flying gloves (outer leather, inner wool), survival knife and PSK-2 kit. Initially I wore one cotton sock and one wool sock. A parachute, flares and a flashlight from a life vest were provided in the field.

After walking for approximately 30 minutes, I became quite warm and began to perspire. At this time I cut the neck and wrist seals of my Mk IV antiexposure suit. This improved the ventilation considerably. Shortly thereafter I cut the opening entrance torso seal to the suit, leaving the front snapped but unzipped. This provided more ventilation and by intermittently moving the front of the suit as a bellows I was able to actively ventilate the suit.

For the remainder of the day while engaged in heavy physical labor or remaining dormant, I was quite comfortable and encountered no difficulty with



overheating or perspiration. I might add that the wrist seals had to be completely removed; merely incising them left a cumbersome rubber flap that constantly got in the way of my hands while I was working.

For the test I was going to wear cotton athletic socks but on the advice of the survival instructor I wore a heavy wool ski sock on one foot. My other foot became so cold and numb that it became necessary to change the cotton sock for a wool one. From this time on my feet were quite comfortable, warm and dry, although they felt a little snug inside the Mk IV suit boots.

During the rest of the day my hands became intermittently cold, numb and useless and it was necessary either to thaw them near a fire or put on a large mitten which proved equally effective. I found the parka hood indispensable in keeping my ears and head warm. It also provided fine protection from the gentle winds and from the falling snow encountered while felling snowladen trees. I didn't have to continually brush the snow off for fear of it melting and penetrating my clothing—the Mk IV's water-repellent characteristics provided ample protection.

In the evening of the first day I took off the Mk IV suit. My socks and feet were warm and dry and it was not necessary to dry my footwear. I slept in a paratepee in a double sleeping bag provided by the survival school. . . . The outside temperature dropped to 25° below zero.

The second day, I wore only thermal underwear and winter flight suit. Mukluks were used for footwear. The temperatures and winds were about the same as the day before. This clothing was equally as comfortable as that which I had worn the day before but I found it necessary to brush the snow from my clothing to prevent it from melting and penetrating my garments.

I found little practical use for the PSK-2 kit, the major item for use being the matches.

Conclusions:

1. The usual underwear worn by aviators while flying the Alaskan area (cotton undershirt and shorts) is inadequate protection against the cold encountered in this area during the winter months.

2. The sockwear usually worn by aviators in the Alaskan area while flying (cotton athletic socks) is inadequate protection against the cold.

3. In land survival conditions the Mk IV anti-exposure suit is relatively comfortable to work and exist in, if it is adequately vented by cutting the seals.

4. The Mk IV suit gave little protection in itself against the cold and wind. However, the added protection of a water repellent piece of clothing with integrated watertight boots makes its continual use and wear very worthwhile.

5. The detachable parka hood was indispensable in protection against the cold, wind and snow.

6. Winter flying gloves with wool inner liners were found to be inadequate protection against the cold unless supplemented.

7. The survival knife was indispenable.

8. The flashlight and flares from the life vest were most useful in obtaining the recognition of the survival party as noted by helicopter.

Recommendations:

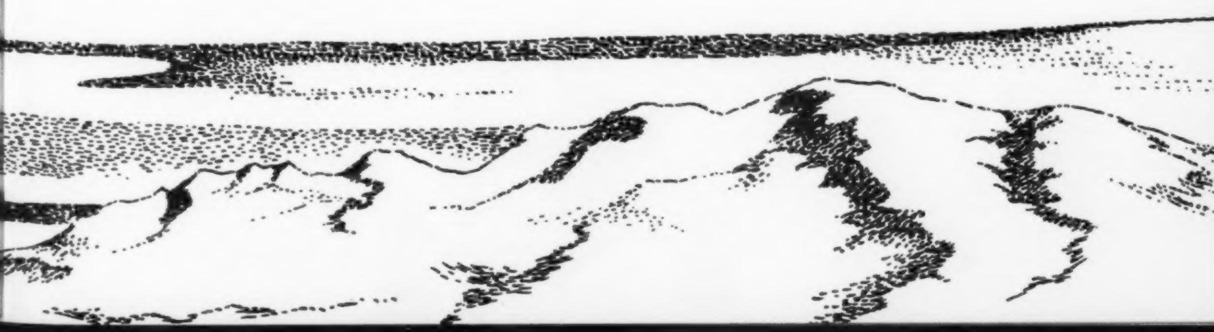
1. That thermal underwear be worn in place of cotton shorts and undershirt during winter flight operations in Alaska.

2. That a larger boot be fitted to the individual to be integrated to the Mk IV suit to accommodate a heavier sock or two pair of medium weight socks.

3. That the seals of the Mk IV suit be incised in the event of a land survival situation.

4. That the Mk IV suit be actively ventilated from time to time to remove excess heat and moisture which may accumulate from the body in a land survival situation.

5. That the boots be left integrated to the suit proper. Removal of the boots from the suit will allow easy access of snow and moisture to the feet and would destroy the watertight integrity of the lower part of the suit. ●



WELL DONE

Ronald R. Martin, ABH2

Late on the night of 16 April 1962, the USS BON HOMME RICHARD was conducting flight operations while the USS PORTERFIELD acted as her plane guard. On the flight deck, an F8U had just been brought up on number three elevator. Ronald R. Martin, ABH2, plane-director, and Thomas L. A. Caspari, a chockman, were just aft of the elevator.

As the aircraft left the elevator and started taxiing forward to the catapult, Martin and Caspari lay down on the deck to avoid the jet-blast. Suddenly, the blast struck them and they found themselves flying through the air toward the outboard side of the ship.

Martin reached down and grabbed a life-net but glimpsed Caspari sailing over the A&R crane in almost a sitting position. He pulled himself up onto the net, passed the word "Man-overboard," over his radio headset, and then threw one of his lighted wands overboard to mark the spot.

Caspari struck the water without injury. On surfacing, he saw the illuminated wand floating between him and the carrier. He swam toward the wand but was unable to close the gap.

Aboard the carrier, PriFly now had the wand in sight and dialed Pri-Tac on the ARC-27A UHF to provide the PORTERFIELD with ranges and bearings.

The destroyer sighted the wand and steered for it. Caspari who was between the wand and the destroyer found this was a dangerous position and began to yell. The destroyer turned to starboard and a searchlight "locked-on" Caspari.

Thomas L. A. Caspari, AN

Michael K. Judd, ET3

On the foc'sle of the PORTERFIELD, Michael K. Judd, ET3, was standing by in a "wet-suit" and dived in when he saw the victim begin to sink beneath the water. Judd's life-line was too short to reach Caspari and he decided to cut it. The line tender saw the difficulty and cast loose at his end. Judd dived and swam to the man, now rapidly sinking. The victim was brought to the surface and engaged in conversation until the PORTERFIELD boat had them safely aboard.

The standard flight deck wand (S/N 9C-6230-691-1407) was easily seen in the excess of 500 yards and was the most important factor in the location and rescue which followed.

The Naval Aviation Safety Center bestows a Well Done to both Martin and Judd for their level headed, life-saving actions. It has been noted that other commands are making it SOP to throw a standard flight deck wand overboard in similar situations. ●

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Short Ladder

On a September night the lieutenant preflighted and manned an FJ4B for a scheduled night carrier refresher flight. He was launched at 0135 with what appeared to be the beginning of a normal catapult shot. Shortly after the holdback fitting broke, the aircraft stopped accelerating normally, pitched up sharply, started swerving to the left and then went over the bow at a speed of about 40 knots relative to the ship. The pilot reached for the face curtain. The airplane struck the water about 300 feet ahead of the ship and sank almost immediately. The pilot found himself in the water free of seat and aircraft but attached to a streamed parachute. He was rescued about 19 minutes later by the plane guard destroyer.

"The last thing I remember was reaching for the face curtain on the ejection seat, but I am not sure I pulled it," he stated after the accident. "The next thing I remember was being under the water but I was breathing. Then shortly thereafter I came to the surface and saw the carrier bearing down on me. I felt as if I was in a kelp bed but found it to be my parachute. I got rid of my chute and turned on the high intensity survival light (which the squadron was evaluating), popped the right side of my flotation gear, turned on my steady white light, and popped the left side. Then I unhooked my steady white light from my vest and, pinning it to a hole in the seam of my right glove so as not to lose it, I started waving the light and whistling loudly through my teeth. . . ."

The plane guard destroyer came alongside and lowered a ladder to the pilot. The bottom of the ladder, however, was about three feet above the surface of the water. Because of the weight of his seat pack, harness and other survival gear, the pilot could not hoist himself high enough on the ladder to put his foot in the lowest rung. A swimmer from the destroyer secured a line around him and he was pulled up and onto the deck of the ship.

If a pilot were incapacitated or if the seas were very rough, a short ladder could spell the difference between a successful recovery and another "almost rescued" pilot, the flight surgeon stated.

In spite of the ship's lack of an adequate ladder, the Aircraft Accident Board was generally complimentary of the destroyer's rescue operation:

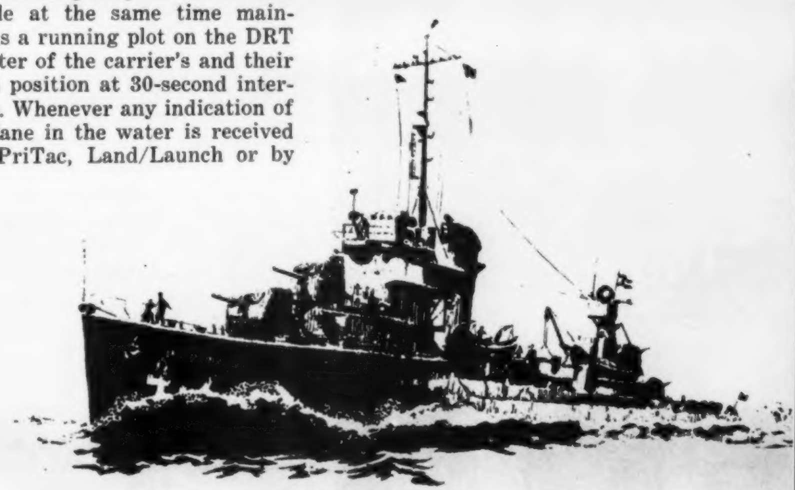
"Upon investigation of the procedures followed by the destroyer while acting as plane guard, several employed factors were noted that greatly increased the effectiveness of rescue operations.

"CIC monitors the land/launch frequency of the carrier while at the same time maintains a running plot on the DRT plotter of the carrier's and their own position at 30-second intervals. Whenever any indication of a plane in the water is received on PriTac, Land/Launch or by a lookout, the positions are immediately marked, annotated with bearings to the scene if given and the scale expanded to 500 ft/in to permit accurate conning to the area of the downed plane at night or in poor weather.

"Also, at all times during plane guard duty, the destroyer maintains two swimmers on deck. At least one of them goes into the water as soon as the ship gets near the pilot to attach a line to him and assist in getting him aboard.

"The destroyer's standard procedure is to utilize a bow pick-up rather than bring a pilot alongside as the possibility of sucking a deployed parachute into the main induction valves exists.

"The Aircraft Accident Board feels that the excellent procedures followed by the men of the destroyer combined with the efficiency and skill with which they carried them out contributed to the unusually short period the pilot was in the water."



notes from your flight surgeon

POP BOTTLE

YOUR bailout oxygen supply can facilitate your survival in an underwater escape as well as during parachute descent. An A3D accident which occurred during carrier operations at night illustrates the advantages of using bailout oxygen underwater. . . The bombardier did; the pilot didn't; and the third crewman was not wearing his mask because of regulator failure*

"I don't recall any impact with the sea," the bombardier-navigator stated. "The warm water was swirling over me, so I popped my bailout oxygen bottle and released my parachute leg straps. In retrospect, I'm glad I did this because it permitted me more freedom of movement and at the same time the parachute gave me some buoyancy. I had to thrash around quite a bit to free myself from some gear that was holding me down and at one time I felt that I was upside down. It was awfully dark. I turned on my survival light to see if it could help me find the upper hatch, but it didn't; the water was full of tiny bubbles and appeared milky.

"At no time did I experience any sensation of lack of air, but I don't remember feeling any pressure from the bailout bottle. I remained on aircraft oxygen until the chute connection pulled out and by that time I had pulled my bailout bottle. I don't remember swallowing any sea water at all. Although the nape strap on my helmet was tight to the point of being uncomfortable . . . my helmet had fallen over my forehead. I loosened the chinstrap and pulled my helmet off. The next thing I remember, I was at the surface. . ."

The pilot in this accident took his oxygen mask off shortly after impact. Thrashing and struggling to free himself from the cockpit, he ran out of air before surfacing and was gulping sea water. He was completely exhausted by the time he surfaced and had to hold on to the bombardier-navigator. The bombardier-navigator inflated the pilot's life preserver and turned on his one-cell flashlight.

All three survivors were rescued by a motor whaleboat from the carrier.

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*Theoretically, the crewman could have replaced his mask and breathed from his bailout bottle, but under the existing emergency conditions the likelihood of a survivor thinking this through and carrying it out is remote.

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Disconnected Hose

ON a carrier approach, an F8U settled rapidly, struck the ramp, skidded down the deck and caught the No. 5 wire. The pilot was thrown forward and to the left during the accident. His anti-G suit hose which had come loose at the plug-in became firmly wedged between the left console and the seat. Pulling against the hose only made the situation worse. Rescue personnel had to cut him free.

Other pilots in the squadron have reported getting the anti-G suit hose wedged between seat and console but *only after purposely disconnecting the hose from its fitting.* It is thought that the pilot in question failed to make sure that his anti-G suit hose connection was properly inserted into the plug-in fitting prior to takeoff and that the hose came loose in flight.

All pilots should make sure that the anti-G suit hose connection is properly seated in the plug-in fitting to avoid inadvertent disconnection. A disconnected hose cancels out the suit's protection and, as in the accident described above, can complicate emergency egress and rescue.

Neck Ring

JUST after catapult launch, the AD swerved, crossed over the carrier bow, dropped into the water and turned over. The pilot made a Dilbert Dunker type escape.

Contrary to regulations he was wearing a neck ring in his Mk-4 anti-exposure suit. His suit was partly filled with water before he was rescued.

The danger of wearing a neck ring in a poopy suit is obvious: this unauthorized practice can mean death in a cold water survival situation.

Poopy Suits

RUMORS that it is often impossible or very difficult to abandon a ditched helicopter while wearing the Mk IV antiexposure suit are unfounded. The Naval Aviation Safety Center has searched its records as far back as 1958 and there is not a single case on record of exit difficulties during helicopter ditching with a Mk IV suit. Other than the occasional problem of suit leakage, the poopy suit is worn with confidence by fleet HU, HMR and HS crews.

—*NAS Seattle Safety Council Minutes*

A Must

PILOT after ejecting into woods: **"An addition to my survival gear in the future will be a compass."**

No Life Vest

SHORTLY after takeoff on a cross-country ferry flight, the pilot of an F9F ejected off the coast. In violation of OpNav Instruction 3710.7A which requires life vests on over-water takeoffs and landings, he was *not* wearing a life vest. The pilot explained his failure to wear flotation gear as a "calculated risk."

He was lucky on two counts: he was uninjured and his parachute descent terminated some 150′ south of the shoreline. He got rid of his parachute and began to swim to shore. As he floated and swam on his back suddenly the irony of the possibility of drowning in 8 feet of water after a successful low level ejection struck him and he began to shout for help. A man on the beach swam out and towed him in.

"As for the large number of aviators who fail to utilize safety and survival equipment," the reporting flight surgeon stated, "one can only wonder how they can risk their lives when the price of safety is relatively so inexpensive."

Manned Flight

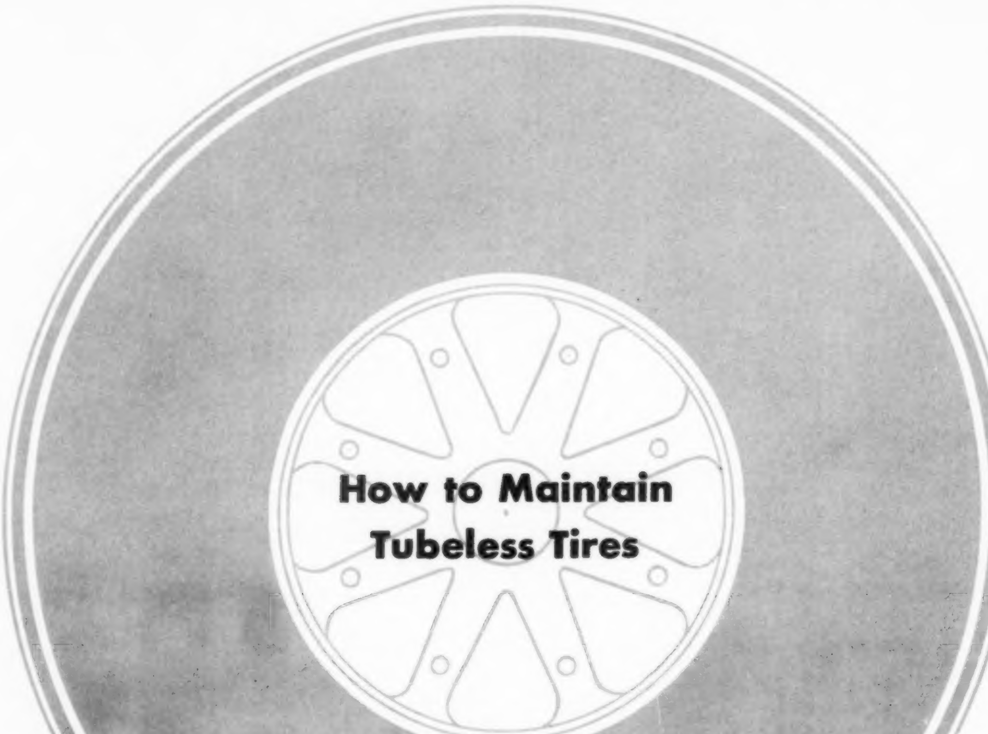
CONGESTION of work areas and urgency of operations necessitate extra vigilance on the part of ground crews to prevent injury.

An ordnanceman was loading Sidewinders on a flight of four F4Ds departing for a deployment. Two ADs and a GV in the area were warming up to follow the F4Ds in departure. Completing his check of the last of the planes to be loaded, the ordnanceman gave the pilot a thumbs-up from the port side. He turned and walked directly port of the aircraft to join the other ground crewman. He was hit from behind by a jet blast that pushed him onto the boundary area of the apron, lifted him into the air and blew him 30 feet forward and onto the grass.

The injured man was wearing his field jacket unbuttoned. The blast ballooned his jacket and forced his arms into "a flying position" which contributed to the force lifting him off his feet. He suffered a broken leg.

P5M Blackout

A MAINTENANCE man was making repairs on a P5M-2 in total darkness except for a flashlight. As he stepped backwards on the engine stand to get some tools, he fell through an unprotected opening to the concrete floor 12 feet below. He struck on his left shoulder and head, suffering a concussion and skull fracture. ●



How to Maintain Tubeless Tires

by

E. Turner and R. Weaver

Special Service Representatives
The B. F. Goodrich Co.

Reprinted from April 1962 "AIRLIFT,"
1001 Vermont Ave., N.W., Washington, D. C.

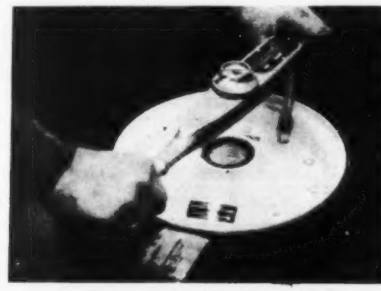
Why do tubeless tires lose air pressure? There's no single answer, but there are a number of factors which individually or in combination contribute to the problem.

Aircraft wheel and tire buildup takes times and costs money. Since there are many causes for air loss other than the tire itself, it pays to follow a systematic checklist. Otherwise, if an assembly is wrongly condemned as a "leaker" trial-and-error substitution of parts can pyramid tire costs.

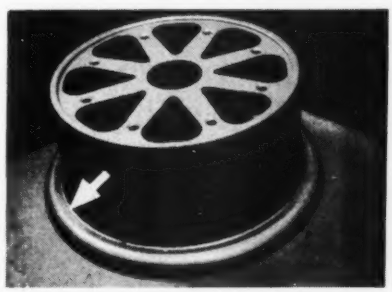
Complaints of air loss in tubeless aircraft tires, while more common in cold weather, have no seasonal

Inflate tire, then let it stretch."

Major areas of tubeless tire.



Torque wrench is a must tool.



Remove serrations (arrow) on wheel.

limits. Factors which may deem distantly related, such as personnel changes in the tire shop, inaccurate gages, air temperature changes and the like often are underlying causes of complaints, further emphasizing the need for a simple check procedure.

Here are general areas of the tire/wheel unit which can cause air loss and why: Wheel flange/bead ledge—Cracks usually due to fatigue damage or scratches or gouges due to handling damage or improper use of tire irons. Others are: exceptionally smooth enamel surface on bead seat ledges; corrosion or wear of bead ledge area (usually at toe area of bead); poor surface of bead seat due to rubber or dirt deposits; and knurls—tube-type wheels converted to tubeless duty should have knurls removed.

On each of the above, maintenance and rework methods are available from wheel manufacturers.

Wheel tubewell—Porous magnesium wheel castings. Proper painting and/or impregnation will solve this problem. Cracks in tubewell, although usually not repairable, offer the safety advantage of leaking off tire pressure and preventing an explosive failure from weakened wheel structure. Holes through tubewell where wheel components are attached will leak if not sealed properly.

Seal area—Handling damage or improper machining of sealing area must be repaired before remounting. The sealing surface must be entirely clean of foreign material or paint. A light, even coat of primer is permissible, but surface must be free of "runs" or dirt inclusions.

Improper installation of O-ring seals, seal twisting, or lack of specified lubrication can cause leaks. Do not use wrong sizes or types not specified by wheel supplier. The compound, for example, may not perform properly at low temperatures. Careful inspection should weed out seals that are thinned out, deformed, chipped, damaged or otherwise deteriorated.

Improperly torqued wheel tie-bolts may result in inadequate compression of sealing O-rings under all temperatures. Low torques combined with low temperatures and wheel shrinkage may reduce compression of the seal to the point of leakage.

Valve area—Again the surface for sealing tubeless valves must be free of scratches, dents and foreign matter. The rubber grommet or O-ring must be the right one. And tightening of tubeless valves should follow wheel-builder's instructions.

Valve cores should be leak-tested and protected

with valve caps applied finger-tight.

Thermal bolt—Faulty thermal bolts can leak, sometimes due to poor bond between melting material and bolt body. Bolt sealing gasket surface must be clean and free of scratches. Surfaces can be repaired in some cases. Check manufacturer. Proper sealing gasket must be used, properly sized and compounded for the job and free of cuts and distortions.

The best insurance against air loss in the above areas is complete and careful inspection before buildup. If, however, leaks occur after assembly, use soap solution or, preferably, completely immerse the wheel-tire unit to pinpoint leak source.

The tire—Look for damaged beads, such as exposure of cord body in bead toe area or under face of bead. (Do not confuse with finishing strip which is a regular part of tire construction).

Beads may not be seated properly. This results from insufficient tire pressure, lack of bead lubrication or a kinked or distorted bead.

Other checkpoints: damaged liner with exposure of nylon ply cords underneath; and, cuts or punctures penetrating cord body and liner. If you inflate tire in heated room and then store it outside, air pressure drop will be about 1 psi for each 4° drop in temperature. Check and adjust air pressure only when tires are cold (outside air temp).

Tire Points

TO PREVENT accidents caused by tire failures USAF T.O. 1F-100-177 sets up a point system which credits each main gear tire with a given number of points for each takeoff, depending on the takeoff gross weight of the airplane. When the tire accumulates 40 points, it must be replaced as it is unsafe for takeoff. Also, if the installed tire will exceed 40 points after the next flight, the tire is considered unsafe and must be replaced. Each main gear tire will accumulate points as follows:

Points	Airplane Takeoff Gross Weight
2	35,000 pounds or less
3	35,001 to 37,000 pounds
5	37,001 pounds or more
40	Any aborted takeoff at 37,001 pounds or more in which the drag chute is used and an airspeed of 140 knots IAS or greater is reached.
40	Any aborted takeoff at 37,001 pounds or more in which the drag chute is not used and an airspeed of 100 knots IAS is reached.

Tubeless tires are vented in the sidewall area to permit escape of air that diffuses through liner and cord body. If this air cannot escape, pressure build-up within cord body may cause blisters in sidewalls, tread or ply separation.

Vent holes vary by manufacturer in location, depth, angle, size and rate of diffusion, but rate should not exceed 5% in 24 hours. When water or soap solution is brushed over tire air bubbles will form at vent holes, some in a continuous stream and others only intermittently. This is normal. However, if air from vent holes can be felt 4" or 5" away, look for injury inside tire.

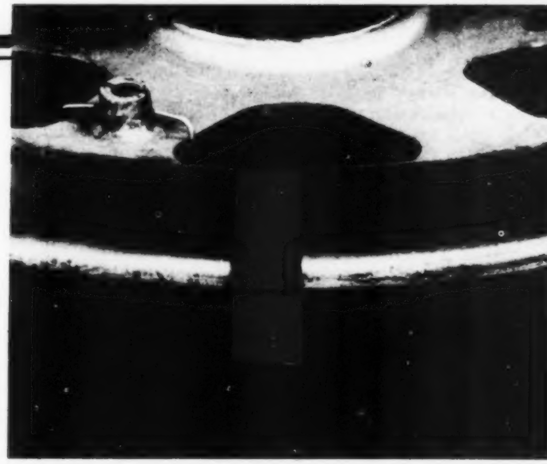
Unless some damage has occurred, or there has been some failure of other components of the assembly, a tubeless tire that has held air throughout most of its tread life is not going to suddenly become a "leaker." Air retention properties of liners in most tubeless tires will not change, either through continued use or because of retreading one or more times.

Care should be taken to avoid spilling materials over a tire that would close vent holes directly or by causing a swelling of sidewall rubber. Do not plug holes with tire paint or dressing. Be sure vents are not closed during recapping and that they are re-vented after recapping.

Nylon cord tires stretch after inflation and this, in itself, reduces air pressure. Tires must be inflated to proper pressure and let stand at least 12 hours for this expansion which may result in as much as a 5% drop in pressure. Compensate by reinflating to original pressure. Only after this initial stretch period can one determine if there is any true air loss within a tire.

Beware of air pressure gages. Quite often it is found that the difference in recorded pressures is not air loss, but simply use of two different gages. It is not unusual to find a gage tagged "reads X lbs. high (or low)," but this error might not be consistent at different pressure levels. A gage reading 10 lbs. high at 80 lbs. may read 25 lbs. high at 150 lbs. Don't use inaccurate gages; rather have them repaired or replaced.

Cold temperatures, too, may affect gages and cause low readings. Gages treated with oil or other lube as a "fix" will give incorrect readings and probably will prove unfit for further use. It is a good practice to have gages recalibrated and to always use the same gage when checking a tire, both before and after the initial 12 or 24 hr. stretch.



TIRE SLIPPAGE MARKS

BuWeps message 182055Z of May 1962 calls attention to the application of tire slippage marks to aircraft wheels utilizing low pressure tires with inner tubes installed. Tire slippage marks are also required for all helicopter wheels.

General Manual for Structural Repair AN 01-1A-1 states:

"To provide visual means for detecting tire slippage and thus prevent failure of the valve stem, a red stripe 1 inch wide by 2 inches long should be painted across the rim flange and tire sidewall of each wheel, extending 1 inch on rim and 1 inch on tire as shown in figure 2. This marking is painted on after the casing is mounted on the wheel. An inspection must be made after each flight to see that these markings coincide. If the tire slips on the rim as much as $\frac{1}{4}$ to $\frac{3}{8}$ inch the tube should be deflated, and the tire turned sufficiently to recenter the valve in the valve hole of the rim. Failure to make these inspections and adjustments may result in excessive slippage and cause the valve to be ripped from the tube."

NOTES AND COMMENTS ON MAINTENANCE

Water In Fuel Tanks

IT IS apparently not known by most pilots, but the presence of small quantities of water in aircraft fuel tanks is a usual thing. This condition is particularly true in latitudes where high humidity is coupled with radical temperature deviations between day and night. Moist, relatively warm air is drawn in through tank vents and, upon subsequent cooling, precipitates considerable condensation. The situation is aggravated by allowing aircraft to stand idle with only partially filled tanks.

Water which may be delivered into aircraft tanks by refuelers, settles without delay to the low points in the tanks and can be immediately detected by post-fueling samples.

Another source of water was found in the SNBs and it might be true in other aircraft. When excessive quantities of water (2 cups per tank) were found, an investigation revealed that auxiliary (rear) tank filler caps on SNBs are located in a cavity which traps rain water. This recess is provided with a small drain line, which plugs easily and must be kept clear or water stands appreciably above the level of the filler cap. In turn, poor filler cap gaskets permit seepage of considerable water into the tanks.

Note: A little checking revealed this condition (leaky gaskets and plugged drain lines at auxiliary filler caps) to be present on *many* transient Beechcraft.

When you drain the low points, to check for water, use a glass container of good size. Sub-freezing weather can result in freezing of sizable quantities of condensate in the fuel tank sumps. Under these conditions, low-point drain samples will reveal no free water until subsequent elevated temperatures result in melting the ice cube.

Then there is another point to be made. At this time of year, engine malfunction is frequently caused by carburetor icing. This occurrence, together with all manner of ignition system discrepancies, is invariably reported as fuel contamination by pilots and/or unknowledgeable maintenance personnel upon observing the normal small quantities (four tablespoonfuls for an SNB, after a quick temperature change) taken from low-point drains.

Most aircraft fuel systems take suction at a point slightly above the low-point tank drains, so:

a. Drain low points regularly and check for water.

b. Keep tanks full of fuel.

c. Check the filler neck gaskets and keep the recess drain lines open.

d. Use carburetor heat to prevent icing and for better combustion, unless you are operating equipment that doesn't require it.

Smoking Facts

THE next time you light or discard a cigaret, if you remind yourself of two facts we are sure that you will not be in the ranks of the negligent smokers.

First, a burning match has a temperature of 2000°F. and a lighted cigaret has a temperature of 1800°F.

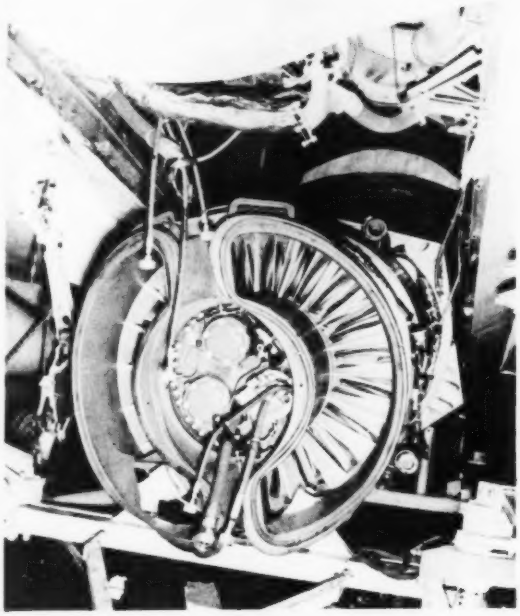
Match these temperatures against the flash points and ignition temperatures of various substances common to your work or surroundings and you will understand why extra caution is necessary.—*States Marine Lines.*

What to Look For to Avoid Future Accidents

Here are some well known causes:

- **Incomplete preflight briefings.**
- **Lack of consideration for individual capability.**
- **Improper evaluation of conditions or capability of individuals.**
- **Lack of specific, clear instruction or directions.**
- **Failure to assure understanding of instructions or directions.**
- **Failure to notify people concerned of changed conditions.**
- **Inadequate or improper inspection.**
- **Allowing an unsatisfactory, but correctible situation to exist.**
- **Failure to provide adequate directives and regulations.**
- **Release of improperly maintained aircraft for flight.**
- **Failure to provide the proper training.**

Put a chock under the hazard before it starts rolling —once it starts, it's too late to stop it!



Dropcheck Not OK—During installation of a J57 engine in an F4D, the rear engine hoist cable parted dropping the engine four feet onto the engine stand. Damage to the engine and related parts required replacement. Several similar failures seem to stress the need for thorough sling inspections prior to each use. Mechs and inspectors read and please heed.

A4D-2 Altimeter Errors

FOLLOWING a rash of altimeter errors (reading high) Douglas Aircraft Co. determined that these were caused by burrs and irregularities at peripheric static vents. While these errors were found mainly in 148/149 series aircraft they can exist in other A4D-2Ns.

It was recommended that all A4D-2N aircraft be inspected for this type discrepancy around the port and starboard static vents.

Where such exist these are to be removed from the static plate by gently sanding surfaces with no. 400 emery cloth and finished crocus cloth.

Use extreme caution in dressing static plates to prevent forming a chamfer at static port or scratches on the static plate.

If a chamfer exists there, static port must be reamed to produce a sharp edge. Reaming should be kept to a minimum. For this process the static lines should be removed to prevent foreign objects from entering the system. Surface flatness must be reworked after reaming.—*BuWepsRep Long Beach msg 162312Z May 1962 NOTAL*

Altimeter Care

ONE airline reports that a few altimeters on jet aircraft have been removed because of indication errors or flight crew reports of a tendency to "hang-up" during climb or descent.

Shop analysis, in many cases, reveals a damaged nylon gear. This can be induced by rotating the barometric pressure adjusting knob beyond either the 27,-inch or 31-inch setting. The induced error will be of the same magnitude as the degree of rotation beyond the adjustable range limit.

It is realized that pilots, as do master watchmakers, respect and even revere the delicate mechanisms inherent in aircraft instruments. As a reminder, however—"Slow and Easy" should be the watchword when resetting aircraft instruments and controls.

Internal Damage Vice FOD

Situation: Carbon particles damaged T-58 blades, stage 1 turbine, in the following manner:

During engine operation, carbon particle deposits accumulate in the area of the fuel manifold nozzles and in parts of the combustion chamber. These particles eventually break off and move through the combustion chamber, become hard, and impinge upon the stage 1 turbine nozzle, then ricochet to the blades. These blades operate at 2500°F and 26,000 rpm. Carbon particles impinging on the blades under these operating conditions cause dents and cracks in the blades.

Clarification: Any damage such as described above will hereafter be referred to as "internal damage," and an explanation of the source of this damage will be provided in the DIRs. The phrase "foreign object damage" will be limited to damage incurred to the engine as a result of the *ingestion of an object external to the engine.—CO, NAS Jacksonville*

MURPHY'S LAW*

Crusader Cross-up

THERE are four hydraulic hoses from the outboard droop actuator manifold to the two hydraulic swivel joint manifolds located in the wing butt of the *Crusader*. The four hydraulic hoses are marked at the outboard droop actuator manifold. To connect the four hoses it is necessary to run them through a small internal hole in the wing, and feed them back to the swivel joint manifolds.

Installation requires a man on top of the wing to feed the hoses through, and a man under the wing to make the connections. The hoses cross when they pass through the small internal hole in the wing, thereby increasing the possibilty of incorrect installation Each hose is of sufficient length to reach any of the fittings on the two swivel joint manifolds. The fittings on the swivel joint manifolds are exactly the same size thereby adding to the possibility of incorrect installation. Neither the hose assemblies or the two manifolds located in the wing butt are marked or labeled.

The landing droop extend and landing droop extract hose assemblies were crossed with the cruise droop extend and cruise droop retract hose assemblies, thereby causing the outboard droop to be out of phase with the cruise droop and landing droop.

The aircraft was launched at night and the malfunctioning droop was not discovered until airborne. The aircraft was landed without further incident; however, Murphy's Law is applicable to the *Crusader*.

This situation can be prevented by painting the four hydraulic hoses, or by marking the two swivel joint manifolds located in the wing butt. Due to the weakening of the metal by marking or stamping the two manifolds, this squadron will paint each hose and fitting a different color.—*Anymouse*

*If an aircraft part can be installed incorrectly, someone will install it that way!

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LETTERS TO APPROACH

Air Safety Program A Frankenstein? No! Without It Readiness Would Suffer

MajGen R. C. Mangrum in the May '62 Marine Corps Gazette:

. . . The reading public might begin to get the idea that the Marine Corps in air has gone soft . . . Nothing of the sort. It's harder, tougher, more combat ready, more professional, smarter, than any time of our history. And the aviation safety program has had its proper place in this."

. . . I can stroke my long white beard and recall the features of the accident-deterring procedures of my early flying days. If somebody pranged one of our precious Curtiss *Falcons* he set 'em up for the whole group at Caesar's Bar in Tijuana the following Sunday morning. This could be real expensive! Not bad as a deterrent!

Except that nobody ever really found out what was being deterred! And what it did to Monday's accident rate never was subject to analysis! We didn't really learn how to analyze accidents until the Aviation Safety Program came along.

Along about WWII time the accident-deterring philosophy of some of our forebears was "lock him up!" Manifestly there would have been no accident if he had been paying attention, hadn't been careless, hadn't disobeyed something-or-other or instruction. The way to stop this foolishness was discipline. This, of course, stopped no accidents at all and the operational loss rate continued to climb. So finally, as in some other areas of living, science, logic and special training were tried. And high time, too, in view of present-day costs, which govern replacements.

So—the Aviation Safety Program has paid and is paying big dividends. Combat readiness versus aviation safety? Contradiction in terms. Nonsense.

Aviation Safety Program replacing command authority?—Sapping aggressiveness? Ridiculous! Safety record the measure of performance? Absurd.

Yea

MCAS Beaufort, S. C.—As a recent graduate of the Aviation Safety Officer Course, University of Southern California, I was surprised by the ideas which seem to prevail concerning the function of an Aviation Safety Officer.

At USC we were taught emphatically that our job is not to say, "You can't do that because it isn't safe." Rather, with a background of known accident causing precedents or factors (both ground and air) and a good foundation in the better way to do some things, we were enjoined to seek out potential operational hazards and determine if a different way of doing things isn't better or more efficient.

At no time was the strangling of hard, realistic training suggested or implied.

We were taught to be able to recognize the ever-present risks involved in every phase of squadron operations. Our job is to be able to apprise the pilots and men of the degree of risk involved and how best to cope with the particular risk.

The idea is to use the best means or procedure in flying, ground handling or maintenance activities.

As for staff considerations, we were taught to work with and through the S-3, Maintenance Officer or whoever. Using the CO's name is not the approved school solution.

Finally, *my* job is not to cram aviation safety down a pilot's throat. It is, however, definitely to try and interest him in bettering his professional ability through self-education and by presenting to him good, established practices and procedures.

W. R. RIDDELL

• To this we add:

Accidents are accidents only to the ignorant.—George Santayana

The greater the ignorance the greater the dogmatism.—Sir Wil-

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, U. S. Naval Aviation Safety Center, NAS Norfolk, Va. Views expressed are those of the writers and do not imply endorsement by the U. S. Naval Aviation Safety Center.

liam Osler

The origin of all science is in the desire to know causes.—William Hazlitt

Amen—Headmouse

the P3V *Orion* (*Lockheed Electra*) currently undergoing fleet qualification tests at Patuxent River. Initial response is enthusiastic.

W. R. CAMPBELL
HYDROGRAPHIC OFFICE

E6B Templates Being Eaten?

Washington, D. C.— . . . Here are a few pertinent facts on holding pattern entry aids produced by the Hydrographic Office.

We initially produced 12,000 E6B type templates of which some 7800 were distributed. The balance was stocked at the Supply Depots at Clearfield and Philadelphia. This stock has since been depleted. (They must be eating them.) We produced 6000 more which were put in stock at the Supply Depots. In addition to Navy requests, we have received requisitions from the Air Force, such as a request for 1000 from TAC at Langley.

Recently, we began to receive some requests for the Mark II self-sufficient version. We have decided to produce a limited quantity (2000) of this version to be called "Holding Pattern Entry Computer," further identified by an as yet undetermined H. O. Miscellaneous number. This product should be available soon.

Another item of possible interest to you is the recently developed ASW Universal Plotting Sheet (VP-ASW-1) for use with a Dead-Reckoning Tracer currently installed in P2V and P5M aircraft and which will be installed in

Holding Pattern Entry

Pensacola—Your article "Hydrographic Holding Entry Templates" May '62 issue was a boon to those of us that carry a Mark 8B Computer. However, most of us will still check out an E6B for those nice long cross-country hops.

Clarification is requested concerning instruction number 2., "Locate on compass circle the aircraft inbound course TO the holding fix." It is noted the word course is used whereas the Memorandum for Aviators No. 4 of 2 February 1962 states in the lower left corner, "Note: The aircraft heading *Upon Arrival* at the fix will determine the direction of turn." My personal vote is cast for course rather than heading due to the quick, no-change-for-bracket answer. How say you?

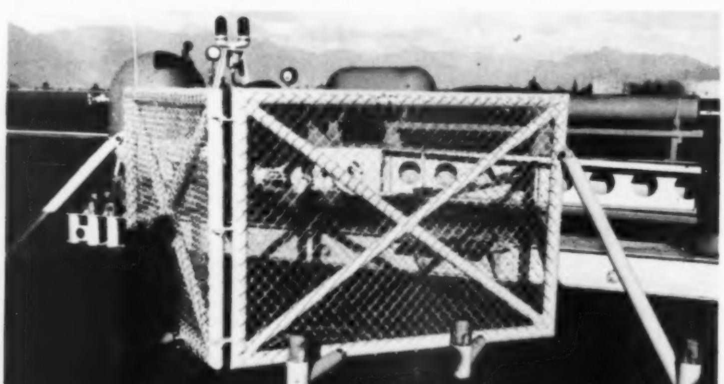
L. D. NEILL, LT

• The official word for Holding Pattern Entry is contained in Section II, Planning of the Flight Information Publication. The note on page II-20 under Section III, Enroute states: "In both standard and nonstandard pattern entries, the aircraft heading upon arrival at the fix will determine the direction of turn. Under normal operating conditions plus or minus 5° in heading is considered within the parameters of good operating practice."

The Mar. '62 issue of APPROACH contained an article "Enter Rightly Hold Tightly" on page 30 which made reference to the aircraft heading upon arrival at fix for determination of turn.

In most cases the pilot can determine in which quadrant he is flying by noting the heading of the aircraft when proceeding toward the fix. The direction of turn at the fix will normally be the same unless radical heading corrections for winds have substantially changed the aircraft heading upon eventual arrival at the fix. This will only occur when in close proximity to one of the quadrant base lines and faced with large corrections for drift.

The reference to "course" is in regard to the inbound course to the holding fix in the holding pattern. The heading of the aircraft upon initial arrival at the holding fix is the determining factor for turn direction.



A portable safety shield proposed by three Marines at MCAS Kaneohe Bay. It is aimed at protecting Morest operators during arrests. Such a protective barrier is recommended by the Morest handbook—but is not furnished. Operating outfits are advised to make their own. This one looks good. It's easily disassembled, shipshape and is a good candidate for standardization. Each half is 5 by 7 feet, made up of 3-inch pipe and cyclone fence or expanded metal. Morest stakes provide firm anchorage. *—S/Sgt Glen S. Jackson, Sgt James R. Barker and Cpl Michael A. Corniola of HQ and HQ Sqdn, MCAS Kaneohe Bay*

Cut APPROACH In!

Has information in APPROACH magazine ever helped you prevent an accident—prevent an injury—or better handle an emergency?

If so, and you have not reported it to NASC already, it is particularly important that you do so. This information is vital to both editorial direction and fiscal support of the magazine.

Knife Edge

NASC Norfolk—In regard to your article "Can You Cut It" (July APPROACH) I feel that one very important comment has been left out. "You can't cut it with a dull knife." During my time in two squadrons over the past several years it has been my observation that the majority of pilots draw a survival knife, look at it once and then put it back in the sheath until needed.

Survival knives are *not* sharp in the issued condition. However, 20 minutes of work on an oil stone will produce an edge almost suitable for shaving. When the time comes to cut entangling shroud lines in a salt water environment a sharp knife can mean the difference between a happy and an unhappy statistic.

As the Boy Scouts say, "Be Prepared."

D. L. CAMPBELL, CDR

Purposes and policies: APPROACH is published monthly by the U. S. Naval Aviation Safety Center and is distributed to naval aeronautical organizations on the basis of 1 copy per 10 persons. It presents the most accurate information currently available on the subject of aviation accident prevention. Contents ... Material extracted from mishap reports may not be construed as incriminating under Art. 31,

approach

THE NAVAL AVIATION SAFETY REVIEW

VOL. 8 NO. 3

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Aero-Medical

Maintenance

Departments

Our product is safety, our process is education, and our profit is measured in the preservation of lives and equipment and increased mission readiness.

The "Slow" Approach to Safety

At the outset, it should be explained that this is not an endorsement of "slow approach speeds" as the title may suggest, but simply a reconfirmation of an old adage, "Haste Makes Waste."

There have been many technical improvements in aviation in recent years. The mirror landing system, angled deck carrier, low level escape systems and increased radar coverage are just a few of the many advances which have helped make naval aviation safer than ever. However, there still appears to be room for improvement in the human factor, particularly in the area that results from personnel trying to "rush" a job to completion.

We have all seen instances of the ancient rule of "Haste Makes Waste"— the hastily planned cross-country flight that results in the destination below weather minimums and insufficient fuel to reach an alternate; the plane captain in a hurry to move his aircraft from the fuel pits to the flight line and consequently failing to insure that the tow bar has been hooked up properly; the mechanic rushing a job to completion so he can secure at 1630 and inadvertently installing a brake assembly backwards; the pilot who fails to use his check-off list while hurrying to make a takeoff time consequently taking off with his fuel control switch in manual instead of normal.

These are all examples of safety hazards created by *people* not taking enough time to make sure the job is done completely and thoroughly. This type of human failing has been with us through the 50 golden years of naval aviation and, unfortunately, is still with us today. Of the mishaps encountered by this squadron shortly after rejoining the Second Marine Aircraft Wing, at least 75 per cent were directly attributable to shortcutting established procedures in order to complete tasks more rapidly. Subsequently, within this squadron, the emphasis on the elimination of "short-cutting" has paid good dividends in the reduction of the ground accident/incident rate.

It takes a certain amount of *time to* become a professional in aviation. Conversely, the professional should always *take time* to be sure each job is done properly, thoroughly and safely.—*Hot Dope Sheet 3-62*

LIFT and DRAG

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THE MONTHS AHEAD

No one can measure the future without the yardstick of the past.

LIVES AIRCRAFT DOLLARS MISSION READINESS

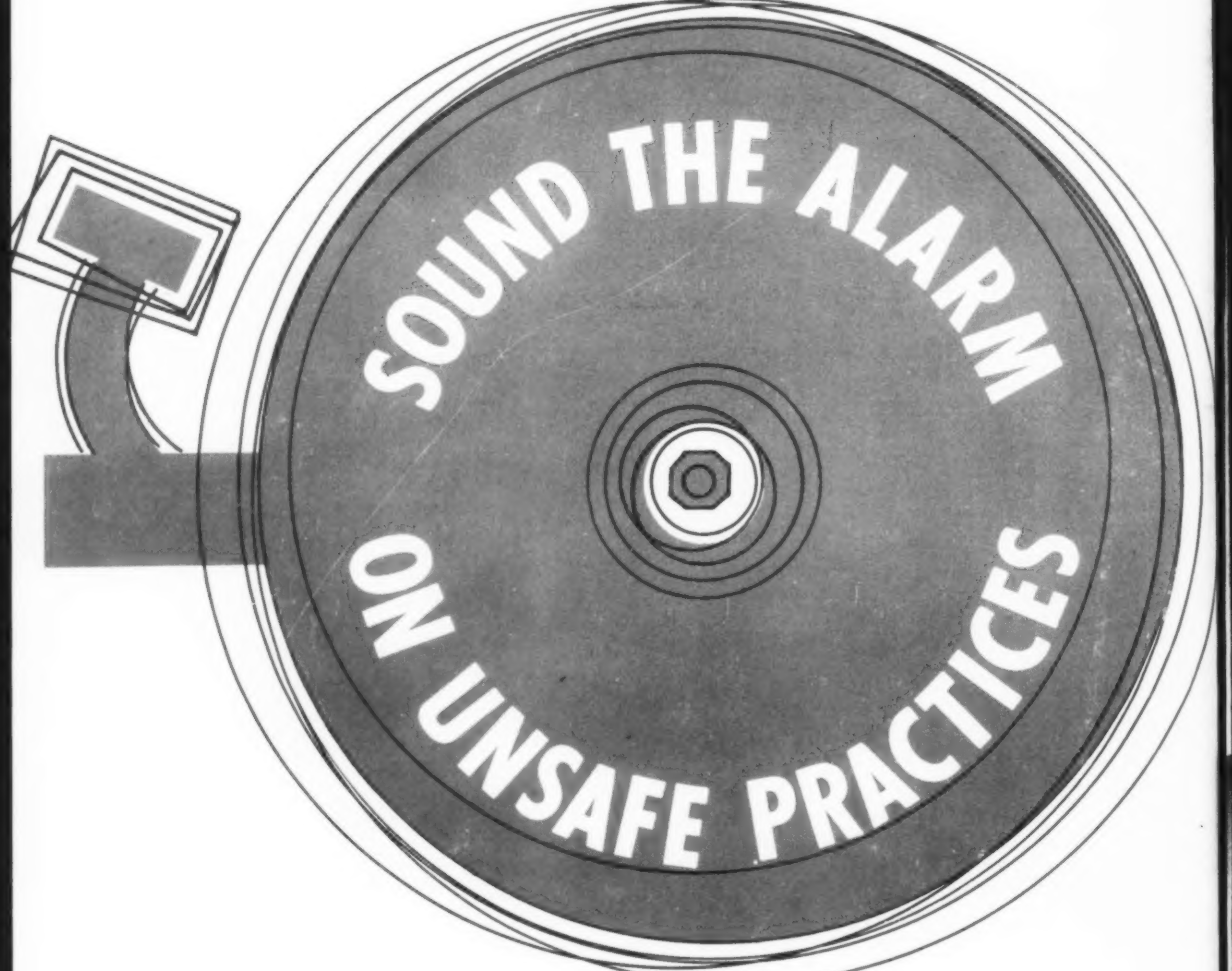
A fresh fiscal year has commenced.
Expectancy and hope are in the air.

What will this fiscal year of 1963 bring?

Pause a moment and appraise the fiscal year just completed.

ACCIDENTS	578
FATALITIES	264
STRIKE DAMAGE AIRCRAFT	322
OVERHAUL DAMAGE AIRCRAFT	88
INCIDENTS	682
COST (AARs)	$285,000,000

Will you or your OUTFIT add or subtract from this toll in Fy 63?



REPORT AN INCIDENT

PREVENT AN ACCIDENT